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Pages 2292 - 2518

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

Before The Honorable James Donato, Judge

IN RE GOOGLE PLAY STORE ANTITRUST LITIGATION,	**NO. 21-md-02981-JD**
THIS DOCUMENT RELATES TO:	
EPIC GAMES, INC., Plaintiff, vs. GOOGLE, LLC., et al., Defendants.	**NO. 3:20-cv-05671-JD**

San Francisco, California

Monday, November 27, 2023

TRANSCRIPT OF PROCEEDINGS

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I N D E X

Monday, November 27, 2023 - Volume 12

E X H I B I T S

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TRIAL EXHIBITS	IDEN	EVID	VOL.
6932		2372	12
6940		2372	12
6941		2372	12
6950		2372	12
6952		2372	12
6956		2302	12

Monday - November 27, 2023 **9:04 a.m.**

P R O C E E D I N G S

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(Proceedings were heard out of the presence of the jury:)

THE CLERK: We're on the record in Civil 20-5671, Epic Games, Inc. vs. Google LLC, and Multidistrict Litigation 21-2981, In re Google Play Store Antitrust Litigation.

MR. BORNSTEIN: Good morning, Your Honor. Gary Bornstein for Epic Games.

MR. POMERANTZ: Good morning, Your Honor. Glenn Pomerantz on behalf of Google.

THE COURT: Okay. Are we all set?

MR. BORNSTEIN: We had just one thing, Your Honor, on our side that we wanted to raise.

THE COURT: Yes.

MR. BORNSTEIN: Nothing to be done immediately, but the parties have spent a lot of time trying to streamline things in light of the conversation that we had before the holiday. I'm pleased to report we've made some success.

THE COURT: All right.

MR. BORNSTEIN: We are, for example, dropping one of the fact witnesses that we were going to be presenting by deposition this morning --

THE COURT: That's good.

MR. BORNSTEIN: -- and streamline some of the expert

testimony as well.

The one thing I just wanted to put on Your Honor's radar one more time was the importance, from Epic's perspective, of having an opportunity for rebuttal testimony from the economists. We've spent a bunch of time trying to figure that out. There are two main issues that I just wanted to flag.

One is that there are certain issues in which the defendants bear the burden of proof, and so our economists addressed those matters just in their rebuttal reports once we got the Google economist reports.

And the other is we really did try to figure out how we could do it otherwise, how we could present everything without rebuttal, and it really would require anticipating what the Google economists would say, explaining their opinions, then responding to them for things that may be -- they would never present in the first place.

So our view that I just wanted to present one more time, Your Honor, was that it would streamline things for our presentation and for the jury by not introducing matters that wouldn't otherwise have to be addressed, and my expectation is any rebuttal that we do can be very brief, focused on just the issues that the Google economists present.

THE COURT: What do you think?

MR. POMERANTZ: Well, Your Honor, you know, Mr. Bornstein referenced the reports. I am almost certain that

their two economists will be testifying to things in their rebuttal reports during their testimony that's about to happen later today and tomorrow. Whether they need a rebuttal case or not, given that they have it, is really something that Your Honor can assess at the time.

MR. BORNSTEIN: I'll just add, Your Honor, the parties had agreed beforehand, and we had talked about this at the trial conference, I realize it's not binding on the Court, but the parties had agreed that we would have the opportunity to present rebuttal testimony from our economists.

THE COURT: All right. Let's -- I won't rule it out. Okay? But I don't want 45 minutes, this is just -- you know, 45 minutes of direct and then 3 hours of, quote/unquote, "rebuttal."

MR. BORNSTEIN: Absolutely not, no.

THE COURT: I don't want that. So if we can make it work and it will save some time, we can try it. Okay?

MR. BORNSTEIN: I appreciate that, Your Honor.

THE COURT: Now, who do we have first this morning?

MR. BORNSTEIN: Well, first, we're just getting the one fact deposition out of the way, which is by video. That will be less than 20 minutes total for both sides. And then we're beginning with the accounting experts from both sides.

THE COURT: Okay. We can make that quick I think.

MR. BORNSTEIN: I think so too.

THE COURT: All right.

MR. BORNSTEIN: I think our examination is going to be 15 to 20 minutes total.

THE COURT: All right. And then what about -- and then the economists?

MR. BORNSTEIN: The economists will come after the accountants from both sides.

THE COURT: All right. Let's not spiral into a black hole of econometrics and Section 2 analysis. Let's keep it -- all right. I will help guide if necessary, but I want to reiterate what I said on Tuesday. This is the week to wrap up the facts. All right? And we're going to press hard.

MR. BORNSTEIN: I understand.

THE COURT: We're going to drive the wagon train over the pass and reach the Promised Land. Okay? That's what we're going to do.

Okay. Let's bring the jury in.

(Proceedings were heard in the presence of the jury:)

THE CLERK: Calling Civil 20-5671, Epic Games, Inc. vs. Google LLC, and Multidistrict Litigation 21-2981, In re Google Play Store Antitrust Litigation.

Counsel.

MR. BORNSTEIN: Good morning, Your Honor. Gary Bornstein for Epic Games. I have with me today Yonatan Even, Michael Zaken, Andrew Wiktor, Lauren Moskowitz, and Brent

Byars.

MR. POMERANTZ: Good morning, Your Honor. Glenn Pomerantz on behalf of Google, and with me are Lauren Bell, Michelle Park Chiu, Lara Kollios, Jonathan Kravis, Leigha Beckman, and Brian Rocca.

THE COURT: Okay. All right. We're back. We're going to work very, very hard to get the evidence closed this week. I can't promise it. As I said during jury selection, it's a live show; but all of us are focused on doing that, so we're going to drive and drive hard. Okay?

All right. Who do we have first?

MR. BORNSTEIN: We're easing into things today, Your Honor. We have a very short video deposition testimony from Christian Cramer.

THE COURT: Okay.

MR. BORNSTEIN: That's C-R-A-M-E-R.

And we have four exhibits to move in without objection, Your Honor.

THE COURT: All right.

MR. BORNSTEIN: Shall I wait for Ms. Clark or --

THE COURT: Yes, please. Just do it, yeah.

MR. BORNSTEIN: The four exhibits we'd like to move in, Your Honor, are 428, 433, 434, and 440.

THE COURT: Any objection?

MR. ROCCA: No objection.

THE COURT: Okay. They're admitted.

(Trial Exhibits 428, 433, 434, and 440 received in evidence.)

MR. BORNSTEIN: Thank you, Your Honor.

(Video was played but not reported.)

MR. BYARS: Good morning, Your Honor. Brent Byars for Epic.

Epic calls Mr. Ned Barnes.

THE COURT: Okay.

(Pause in proceedings.)

THE CLERK: Please raise your right hand.

NED BARNES,

called as a witness for the Plaintiff, having been duly sworn, testified as follows:

THE WITNESS: Yes, I do.

THE CLERK: Thank you. Please be seated.

Please state your full name for the Court and spell your last name.

THE WITNESS: Ned Barnes, B-A-R-N-E-S.

THE CLERK: Thank you.

MR. BYARS: Your Honor, to expedite things a little, the parties have agreed that a summary exhibit reflecting Mr. Barnes' analysis could be admitted at this time. So I offer into evidence Exhibit 6956.

MR. ROCCA: No objection.

THE COURT: Okay. It's admitted.

(Trial Exhibit 6956 received in evidence.)

DIRECT EXAMINATION

BY MR. BYARS:

Q. Mr. Barnes, what line of work are you in?

A. I am a forensic accountant. I'm also a CPA, certified public accountant.

Q. Where do you work, Mr. Barnes?

A. I'm affiliated with a consulting firm called the Berkeley Research Group, or BRG for short, headquartered across the bay in Emeryville.

Q. Can you explain for the jury what a forensic accountant does?

A. Yes. Forensic accounting is a branch of accounting that involves the investigation, analysis, and review of accounting records and other business financial records; and forensic accountants typically employ a set of methods, tools, and techniques to investigate and verify the integrity and the reliability of accounting data and other business data.

Q. Mr. Barnes, do you have credentials, educational credentials, relevant to your work?

A. Yes, I do. As I mentioned, I'm a CPA, I'm a licensed CPA, and I'm also a certified fraud examiner, and I have a Bachelor of Science degree in accounting from George Mason University.

Q. Could you please briefly explain some of the assignments

that you've performed as a forensic accountant?

A. Sure. It varies quite a bit, but I've conducted investigations involving allegations of embezzlement or corporate fraud.

I've utilized forensic accounting techniques to conduct valuations of businesses or individual business units and business assets.

And as it relates specifically to this case, I have utilized forensic accounting techniques to investigate and analyze accounting data, including profit and loss statements, for businesses.

Q. And have you previously been qualified as a forensic accountant in other cases?

A. Yes, I have.

MR. BYARS: Your Honor, Epic offers Mr. Barnes as an expert in forensic accounting.

MR. ROCCA: No objection.

THE COURT: Okay. He is qualified on that topic.

MR. BYARS: Thank you, Your Honor.

BY MR. BYARS:

Q. Mr. Barnes, could you please describe the assignment that we asked you to perform in this case?

A. Sure. I was asked to investigate and determine the operating profitability and the operating profit margin percentages for the Google Play Store or Google Play.

Q. And were you able to accomplish that assignment?
A. Yes, I was.
Q. If I could ask Ms. McGuire to go to the slide showing your results.
Could you please explain what appears on this slide for the jury?
A. Sure. It's not on my screen, but I can look over here.
This is a slide that shows --
THE COURT: Just tap that thing.
THE WITNESS: Oh, okay.
THE COURT: Did it come up?
BY MR. BYARS:
Q. Mr. Barnes, it may also be in the pocket --
A. It came up now. Thank you, Your Honor.
THE COURT: Jury, you can see it?
Okay. Good.
Okay. Go ahead.
THE WITNESS: So this slide reflects, from 2014 to 2021, the operating profits that Google Play generated as well as a calculation of the operating profit percentage.
BY MR. BYARS:
Q. And I'd like to break it down in pieces.
First, the blue columns, what do those represent?
A. Those columns are for each year the amount of operating profit that Google Play generated.

Q. And how would you generally define "operating profit"?

A. Operating profit is essentially what's left over after all of the relevant operating expenses are deducted from the revenues that a business generates.

Q. And what does the yellow line represent?

A. The yellow line is a calculation we call operating profit percentage, which is calculated by taking the amount of the operating profit and dividing it by the revenue.

Q. So just to give a practical example, if a company generated $100 in revenue and had a 71 percent margin, what would that mean for its profits?

A. That would mean that there were $29 worth of costs and there were -- after you deduct those costs, there are $71 of profit, which would be a 71 percent profit margin.

Q. And how did you determine the results that are shown in this slide?

A. These results were obtained from my review of business records, profit and loss statements, that were maintained at Google in the normal course of business for Google Play.

Q. And did you do any other investigation to determine whether these results are reliable and accurate?

A. Yes, I did.

Q. Could you please explain the investigation you performed?

A. So, first, I investigated the manner in which the Google Play profit and loss statements were maintained at

Google, and I was able to determine that they were prepared and maintained on a regular and consistent basis in the normal course of business.

Second, I investigated and analyzed the extent to which the results, such as these results, were communicated beyond Google Play up the chain of command; and I was able to confirm that on a regular basis, these results were communicated to various Google executives, including the CFO and the Alphabet board of directors.

Q. And the jury has heard testimony from Mr. Pichai and Mr. Cramer just now that the Google Play P&L statements don't include all costs, that they only include costs that the Google Play team can directly control. Have you seen that testimony?

A. I have seen that testimony.

Q. Okay. Is that statement consistent with the results of your investigation?

A. It is not.

Q. Could you explain for the jury why not?

A. So my investigation found that the Google Play profit and loss statements, which are reflected here, include not only direct costs that would be under the control of Google Play but they include significant allocations of costs that would be controlled or managed by other organizations within Google or centrally at Google corporate.

Q. And not to get too technical, but for the nonaccountants in the room, can you explain how allocations work as you've described them?

A. Sure. Certainly. An allocation of a cost, if there's a cost center that is -- that utilizes or is utilized by several different business units within the company, the management of the company will make a determination typically as to how much of that cost should be assigned to an individual business unit, such as Google Play. That's what we call an allocation of a cost.

Q. And we have a demonstrative showing some examples.

Ms. McGuire. Thank you.

Mr. Barnes, could you explain what this slide is depicting?

A. Sure. During the discovery process of this case, Google was asked to explain several of the costs that appeared on the Google Play P&Ls, and these are some examples of costs which Google explained were not part of costs that would be managed at the Google Play level.

Q. And so, for example, the first one reads "Central" and Google explained that it was costs managed at the central Google level. Is that an example you're describing?

A. That's right. And in their corporate financial statements, their total company-wide financial statements, they include costs such as technical infrastructure and even

depreciation as part of those centralized costs.
Q. And the other two boxes, here one refers to business operations, one is real estate workplace services, how do you know those are not under the direct control of Google Play management?
A. Because my investigation found that those two cost centers were managed directly by Ms. Porat's group, the CFO of Google.
Q. And just to make sure it's clear, the CFO is who?
A. Ruth Porat.
Q. And the "CFO" means the chief financial officer?
A. Correct.
Q. Thank you.
Just to make it very clear, the costs that are depicted here as allocations, are those already reflected in the P&L results that you're presenting to the jury?
A. They are. They are already part of the calculations that we saw on the last slide.
Q. And did your investigation determine whether the Google Play P&Ls also reflected any costs relating to research and development?
A. Yes.
Q. And did you see Mr. Pichai testify that, in fact, in his opinion, the Google Plays were missing costs relating to R&D?
A. I did see that testimony.
Q. And is that testimony consistent with the results of your

investigation on that topic?

A. It's not.

Q. Could you explain why not?

A. Because, again, my investigation of, you know, how Google maintained their -- the Play profit and loss statements in the normal course of business, I found that there were significant direct R&D, research and development, which would be R&D specific to Google Play, but also that there were significant allocations of research and development that would come from other business units or centrally from Google corporate.

Q. And to be clear, the R&D costs that you're describing now, are those also already included in the Google Play P&L data that you're presenting to the jury?

A. Yes, they are. They are reflected in the figures that we saw on the first slide.

Q. And is it proper for a business like Google to determine that costs that benefit multiple business units should be allocated to those various business units?

A. Certainly. That's very typical and provided it's done in an appropriate manner, it's very common to allocate costs that way.

Q. And has your investigation confirmed whether or not, in fact, Google did allocate those shared costs among its business units?

A. Yes, I believe they did.

Q. And was there any other piece of your investigation that you conducted to confirm that the Play P&L data was accurate?

A. Yes. I also performed what accountants refer to as a reconciliation or a tie-out. So by that I mean I was able to identify from Google business records revenue and operating profit data for all of their business units, not just Google Play, and I was able to reconcile that or tie it to their corporate financial statements, which they report publicly to the SEC and to the investment community.

Q. And what does your ability to perform this reconciliation or tie-out tell you about the reliability of the Play P&L information?

A. Well, it essentially means that all of the costs, all of the -- essentially all of the costs that Google as a corporation incurs have been allocated across the various business units.

Q. So does that allow you to determine whether there's some missing bucket of costs that could be added to Play and, therefore, reduce those margins?

A. Yes, it does. And aside from a very small, less than 2 percent, of revenue of unallocated costs, all of the costs have been allocated to the various business units.

Q. And in your investigation, have you identified anyone from Google, either in the normal course of its business or even in the context of this litigation, offering an alternative

calculation of profitability and profit margins based on adding these costs that they contend should be added to the Play P&L?

A. I have not seen any alternative calculation of Google Play's operating profits.

Q. Okay. Earlier you observed that the Play profitability information had been communicated to senior managers of Google and Alphabet. I'd like to show you briefly some examples here.

This slide is Exhibit 434, which is in evidence.

What, Mr. Barnes, did you infer from this document?

A. Well, we just saw Mr. Cramer testify about this document. This was an update on Google Play's performance that was communicated to Ms. Porat, the CFO, and her Council, which was senior business leaders at the company.

Q. Okay. And on the next page there's a slide from within this document.

What information, as a forensic accountant, is this communicating to you?

A. Well, this, again, is consistent with what I found in my work, and what's been highlighted here is one thing that's important to note is that the CFO Council is recognizing that Google Play is a highly profitable business and it has consistently improving margins.

Q. And I'd like to show you what this document is reporting for the profitability and margins, for example, for 2017. Do you see that?

A. I do.

Q. And so in 2017 they were -- they were determining there was a 3.5 billion in operating profits and representing a margin of 52 percent; is that correct?

A. That's correct, and that's consistent with my -- with my investigation as well.

Q. And what has happened to that operating profit and that operating profit percentage since 2017?

A. It's gone up considerably since 2017.

Q. Look at the next slide, which is also in evidence.

Could you explain, you know, what you inferred from this document?

A. Yes. Well, this is a document, one of several that I reviewed, that indicates that Google Play's financial performance is being reported all the way to the Alphabet board of directors.

Q. And is it relevant to you as a forensic accountant that this information is being communicated to the Alphabet board of directors?

A. Absolutely. The board of directors of any company, including Google and Alphabet, is they have ultimate oversight responsibility for the company's management. And in my experience, and this is consistent with the testimony we've heard, information that is going to the board is -- the people responsible for providing that are going to strive to ensure

that it's accurate, it's reliable, and it's complete.

Q. And if we go to the next page, could you explain what you were able to determine on the basis of this slide of the document?

A. Well, this slide shows that this is only for half the year in 2020. So you have to make sure you take that into account. But for the first half of 2020, Google Play -- what was being communicated to the board is that Google Play generated $4.4 billion worth of operating profit, which was a 65 percent operating profit margin.

Q. And were you able to determine, in fact, what the operating profit for the entire year of 2020 was?

A. Yes. It was around 9 and a half billion dollars.

Q. And just to address something else that Mr. Cramer testified about, when you were assessing Play profitability, did you include the revenues and costs associated with the ads that appear in the Play Store?

A. Yes, I did.

Q. And have you seen at some times, as Mr. Cramer referenced, there being P&L data that excludes costs and revenues related to ads?

A. Yes. There were situations where they would have a P&L that would not have the ads revenue; but from my review, on balance, when information for Google Play's performance was being reported to senior levels of management and the board of

directors, they typically included the ad revenue and the costs associated with those ads in the results.

Q. And there's a footnote here that says (as read):

"Inclusive of 1.6 billion ads revenue."

Is that consistent with what you just explained?

A. Yes.

Q. And is this the only example of that that you've seen?

A. No. I've seen it in quite a number of other examples.

Q. And, by the way, the board is being told that these figures include ads revenue. Is the board being told that this excludes some missing periods -- missing set of costs related to Android?

A. No. There's no notification of that.

Q. Would that surprise you that the board was not being told that there were Android costs missing from this data?

A. Well, it would surprise me if, in fact, that were the case, but that's not consistent with my investigation that there are missing costs.

Q. By the way, we saw Mr. Cramer testify earlier that the Play P&Ls were only used by the management of Play. Is that consistent with your investigation of Google's business records?

A. No, it's not.

Q. Why is that?

A. Well, we just looked at two examples of where this

information is being reported to the CFO of Google and Alphabet as well as the Alphabet board of directors. They have a much larger role in the company than just Google Play.

Q. And if someone testified that Alphabet executives do not assess Play profitability as a separate business unit but only in connection with other business units, is that consistent with the results of your investigation?

A. No, that's not correct. That's -- my investigation was exactly the opposite of that.

THE CLERK: What exhibit is already in evidence?

MR. BYARS: Yes, they are.

THE CLERK: No. What exhibit number is it?

MR. BYARS: Oh, I'm sorry. The last few slides, 2728 as well as 434 are both in.

THE CLERK: Okay. Thank you.

BY MR. BYARS:

Q. And were you able to calculate the total profits that Google Play generated in the last decade, since 2011 through 2021, when the last date that we have is?

A. Yes. It's approximately $42 billion in operating profit.

Q. And I'd like to -- I'd like to give you the opportunity to address something that occurred earlier in this trial regarding the payment processer called Paddle. Did you see Mr. Owens of Paddle testify about certain metrics that his company had used?

A. I did. I did read that testimony.

Q. Did you read the testimony where Google's counsel asked Mr. Owens what Paddle's gross profit margin was, and he said it was around 50 percent?
A. Yes, I saw that.
Q. And would it be appropriate for anyone to compare Paddle's gross profit margin of 50 percent to Google's profit margin of 71 percent that you've determined?
A. No. Those are two completely different metrics. Gross profit and operating profit are not comparable at all.
Q. Okay. In what way do they differ?
A. Gross profit essentially only takes into account the direct -- or the cost of sales associated with generating revenue. It doesn't take into account any of the operating expenses that a business incurs. Operating profit takes into account all of the costs.
Q. And Mr. Owens eventually testified as to the operating profits that his company was generating. Did you see that?
A. Yes. He said it would be a negative number. He would have a loss.
Q. Sure. And no profits, only losses; right?
A. Correct.
Q. So if somebody were wanting to conduct a comparison such as the one suggested by Google's counsel, would this be the appropriate comparison?
A. Correct. At the operating profit level, Google in 2021

was 71 percent; and according to Mr. Owens, Paddle would have been a negative number.

Q. Thank you.

MR. BYARS: No further questions, Your Honor.

THE COURT: Okay. Pass the witness.

MR. ROCCA: May I proceed, Your Honor?

THE COURT: Yes.

CROSS-EXAMINATION

BY MR. ROCCA:

Q. Good morning.

A. Good morning.

Q. I'm Brian Rocca. Nice to meet you.

A. Nice to meet you, Mr. Rocca.

Q. Some questions about your background to start.

You don't have an advanced degree in accounting; right?

A. Just a Bachelor of Science degree, correct.

Q. So you don't have a master's degree or a Ph.D. in accounting?

A. That's correct.

Q. You aren't a professor of accounting; right?

A. That's correct.

Q. You don't regularly publish any research that is reviewed by peers on the subject of accounting?

A. That's correct.

Q. Your principal job is to consult or testify in legal

disputes like this one; right?

A. It's something that I do fairly frequently, but it's not -- a fair amount of my work is also consulting outside of litigation.

Q. Your experience in accounting principally is in a dispute-resolution context; right?

A. It's a significant -- it's a significant portion, yes.

Q. Now, you testified that you conduct investigations into accounting fraud. Do you remember testifying to that?

A. I have done that.

Q. Just to be clear, there's no allegation of fraud in this case; right?

A. No, not that I'm aware of.

Q. In fact, you're asserting the opposite. You're asserting that Google's accounting records are credible here; right?

A. That was the results of my inquiry, yes.

Q. So, Mr. Barnes, there are four topics I want to ask you about, and I think we can move through these very quickly and efficiently.

The first one, you understand that Google Play is an app store; right?

A. I do.

Q. You're not offering any opinion here as to whether Google Play earns higher profit margins compared to any other app store; right?

A. I have not -- I'm not offering that opinion. I have not made that inquiry.
Q. So, for example, you're not offering any opinion here that Google Play earns higher profit margins compared to the Apple App Store; right?
A. I am not.
Q. You're not offering any opinion here that Google Play earns higher profit margins compared to the Samsung Galaxy Store; right?
A. That's correct.
Q. Same thing for the Amazon Appstore; right?
A. Correct.
Q. Same thing for the Sony PlayStation Store; right?
A. Correct.
Q. Same thing for the Microsoft store for Xbox; right?
A. Correct.
Q. And the same thing for the Nintendo EShop; right?
A. Correct.
Q. Same thing for the Steam store; right?
A. I'm sorry. I don't know -- I'm not familiar with that one.
Q. It's another store on PCs --
A. Okay.
Q. -- is the Steam store.
A. I haven't offered that, no.

Q. Okay. So I have a demonstrative here to capture this testimony.

Phil, if you could put up Slide 2.

So just so we're clear, Mr. Barnes, in this case you're not offering any opinion as to whether Google has higher profit margins for Google Play compared to any other entity offering similar services; right?

A. That is correct.

Q. You can pull that down, Phil.

Now, you did compare a moment ago Play's margin to the margin of a company called Paddle. Do you remember that?

A. I was shown a slide regarding that, yes.

Q. Right. And your slide cited trial testimony from the founder of Paddle. Do you remember that?

A. Yes, Mr. Owens.

Q. And you're familiar with Mr. Owens' testimony from earlier in this trial?

A. Yes. I wasn't here, but I read it.

Q. Okay. Great.

Let's put up your slide.

First of all, this is Slide 3, Phil.

So this is the slide you just looked at; right?

A. Correct.

Q. Now let's put up Slide 4, Phil, which is the testimony from Mr. Owens.

Now you see in this testimony, Mr. Barnes, that Paddle doesn't have an app store; right? You see that in the first Q and A?

A. I do.

Q. And you see that he admits that Google Play is an app store; right?

A. Yes.

Q. And he admits that Google Play does more than just process payments; correct?

A. Correct.

Q. Okay. So let's update our demonstrative to Slide 5. Okay?

So just so we're clear, you're comparing Google Play's profitability in this Paddle example to something that is not an app store; right?

A. That is correct.

Q. You can take that down.

Second topic. There are a number of factors that contribute to a company's profit margins; right?

A. There certainly can be.

Q. And there can be a number of factors that enable a company to earn high profit margins; right?

A. There certainly can be in the abstract, yes.

Q. So, for example, a company's operations may contribute to high profit margins; right?

A. It's possible.

Q. So a company's operations could lead to higher revenues which could impact profitability; right?

A. Right. If management operates the company efficiently, that could be -- that could contribute to higher profit margins.

Q. Right. And that could mean lower costs if they operate efficiently; right?

A. Correct.

Q. A strong brand might be another factor that contributes to a company's high profitability; correct?

A. It's possible.

Q. And one way to have a strong brand is to offer a superior product. You would agree with that; right?

A. That wouldn't surprise me, that a superior product would generate brand strength.

Q. And those are just a few examples. There are many other factors that could contribute to a company's high profit margins; right?

A. In any given situation there certainly could be multiple factors, yes.

Q. Let's put up a demonstrative to capture that testimony.

Slide 6, Phil. Thank you.

Now, you aren't offering an opinion here, Mr. Barnes, as to whether Google Play's profits are contributed to by any of

these factors; right?

A. I have not evaluated what caused the operating profits. I'm communicating what the operating profits actually were, the results.

Q. Right. So you're not offering any opinion as to whether Google, for example, has a really good brand; right?

A. That's not part of my analysis, no.

Q. Right. And you're not offering any opinion as to whether Google Play is a superior product to others; right?

A. I haven't conducted that investigation, no.

Q. So just to move this along, let's build on this demonstrative.

Phil, next slide.

So you're not offering any opinion as to whether any factor contributes to Google Play's, quote, "high profit margins"; right?

A. Right. That's beyond the scope of my investigation.

Q. Right.

Let's take that down, Phil.

Now, you mentioned that one of the factors that contributes to profitability is costs; right?

A. Costs are a component of a profit and loss statement. So that's something that is going to have to be factored in to determine operating profits.

Q. Right. So let's look at your summary of Google Play's

costs, and I want to show you this. It's Exhibit 6956 in evidence. And it's quite small, but let me say this: This exhibit includes various categories of Google Play's costs; correct? This is your exhibit.

A. Yes. Well, this is not -- this is a summary-level exhibit. So there are additional -- I mean, there's more detail behind each of these lines but, yes.

Q. Right.

Why don't we zoom in on 2015, Phil. I think that's Slide 9.

Okay. So there are categories of costs that you've summarized as total directs cost of sales, infrastructure, and total OpEx. Do you see that?

A. Yes.

Q. And those add up to about $2.4 billion. Does that look about right? I have a calculator here, but I think you wouldn't be surprised --

A. It's in the neighborhood. I'm sure you've done the math right.

Q. Okay. So just in 2015 alone, according to your exhibit, Google Play spent about $2.4 billion to support its Play Store; right?

A. Those were the costs that Google Play incurred in generating the revenue that it generated for 2015.

Q. For 2015, right.

Let's put up the next slide, Phil. So let's capture this in a demonstrative.

This is $2.4 billion in app store costs in one year, 2015. Are you with me so far?

A. I am.

Q. Okay. Now, you didn't compare Google Play's costs to the costs of any other app store, did you?

A. No. That was not part of my inquiry here.

Q. For example, you didn't compare what Google spent on Google Play with what Amazon spent on its app store, the Amazon Appstore; right?

A. No. That wasn't part of my assignment.

Q. Let's put up Slide 11, which is trial testimony from Amazon.

Thank you, Phil.

And you see here that Mr. Morrill is asked (as read):

"How much expense did Amazon incur in connection with its app store from 2015 through 2021?"

And you see that Mr. Morrill responds (as read):

"In the aggregate, roughly $1.4 billion."

Do you see that?

A. I do.

Q. Okay. So in those seven years, according to Mr. Morrill's testimony, Amazon spent $1.4 billion on its app store; right?

A. I see that testimony.

Q. Okay. Let's put up the next demonstrative, Phil.

So comparing these costs, Google Play spent $2.4 billion in one year and Amazon over seven years spent a billion dollars less than Google Play spent. Do you see that?

A. I see what you put on the slide, but you haven't compared the revenue.

Q. Okay. So this is the kind of investment, however, that may contribute to a better product; right? If a company spends more on a product, it's conceivable that it has a better product; is that fair?

THE COURT: He's here as -- how is this related to his qualifications? He's an accountant. He's not here as a product developer. So let's move on to a different question.

MR. ROCCA: Very well.

Take that down, Phil.

BY MR. ROCCA:

Q. Next topic, third topic, you understand that Epic is complaining about the 30 percent service fee; right?

A. Generally.

Q. Right. And you understand that Epic itself charges a 12 percent service fee for its Epic Game Store; right?

A. I've seen reference to that. It's not something that I personally investigated, though.

Q. You didn't conduct an analysis of alternative profitability for Google Play based on different service fees?

A. Actually you're right. Now I do recall, yes.

Q. Okay.

A. I am aware of that.

Q. So specifically you calculated hypothetical income for Google Play based on alternative service fee scenarios; right?

A. Right. There were three.

Q. There were three. And one of those was 12 percent as charged by Epic Games in its store. Do you remember that?

A. I believe that's correct, yes.

Q. And you did these calculations for the period of 2011 through 2021; right?

A. I believe that's right.

Q. Okay. For this analysis, you kept everything the same about the Google Play financial data. You just changed the level of the service fee. Is that fair?

A. That's correct.

Q. Okay. Let's look at Slide 13.

This is a table you prepared. Do you recognize this table?

A. Yes.

Q. And you see that the title says "Comparison of Actual and Alternative Revenue Share Percentages for all App-Related Purchases." Did I read that right?

A. Yes.

Q. Now let's just focus on the top row, which says "Actual."

MR. BYARS: Your Honor, objection. This is not responsive to an opinion that Mr. Barnes is offering today.

THE COURT: Well, I agree with that. I'll let you have a little leeway, but we've got to get moving here.

MR. ROCCA: Thank you, Your Honor.

THE COURT: So just get right to the punch line. Okay?

BY MR. ROCCA:

Q. Okay. The punch line is, Mr. Barnes, that when a number is in parentheses, that means that the company lost money that year; right?

A. In that individual year, there would be an operating loss or a negative operating profit.

Q. Okay. Let's go to the next slide and let's look at the 12 percent calculation.

So we've blown up the 12 percent. So this applies 12 percent that Epic Games is arguing in this case is a more fair service fee to the Google Play data. Is that fair?

A. Well --

Q. That's what your table shows.

A. Your preamble there, I presented the math.

Q. Okay. And let's look at the math.

So this math shows that in 2011 and 2012 Google Play would lose money; right? That's the numbers in the parentheses?

A. They would have operating losses through 2017.

Q. Okay. So in 2013, instead of making $300 million as it did in the actual world, Google Play would lose $597 million; right?

A. They would have operating losses through 2017 at which point they would have significant operating profit.

Q. In 2000 -- that wasn't my question. My question was: In 2013, your calculation shows a $597 million loss; right?

A. That's correct.

Q. And in 2014, instead of a profit, Google Play would have lost over a billion dollars; right?

A. That's correct.

Q. And in 2015, instead of making a profit, they would have lost over $564 million; right?

A. That's correct.

Q. I'll spare you the rest.

It wouldn't surprise you that those numbers add up to over $3 billion in losses based on your hypothetical calculation; right?

A. Through just 2017 or are you counting the years where they actually made significant profits?

Q. I'm focusing on the years where Google Play would lose money. And according to your calculations, if Google Play would have charged 12 percent instead of what it actually charged, it would have lost over $3 billion from 2011 to 2017; right?

A. Holding everything else completely constant, that's correct.

Q. You can take that down.

Last topic. Now, for all those numbers we just looked at, if we were to add in more costs to Google Play than were shown on those exhibits and kept everything else the same, Google Play would have been even less profitable; right?

A. If you artificially add costs, you're going to erroneously calculate different lower profit margins.

Q. Okay. You added some words there.

All I'm asking is: If you added in more costs, profitability would go down keeping everything else the same; right?

A. That's math, but that's not -- that's not proper financial analysis.

Q. Okay. We'll get to that.

So let's talk about your assertion that the Android costs don't belong in the Google Play profitability analysis.

Do you remember testifying that Google keeps a separate profit and loss statement for Android?

A. I'll answer that question because I don't agree with your preamble, but I do recall that I did testify that there's a separate profit and loss statement for Android.

Q. And that profit and loss statement shows all costs; right?

A. It shows -- it shows that Android was operated at a loss

and did not have revenue.

Q. It shows that Android was a massive investment that Google made to support the ecosystem; right?

A. It had significant costs.

Q. And the costs totaled over $40 billion; right?

A. I don't recall the specifics. I saw that reference to that number in Mr. Cramer's testimony, but I don't have that in front of me.

Q. Well, you testified earlier that Google Play made, was it $42 million in profits according to your analysis?

A. From 2011 to 2021, that's correct.

Q. But your opinion doesn't consider that Google spent over $40 billion to support Android; right?

A. That's not true. That's incorrect, sir.

Q. Well, you recognize in this case that the lawyers that hired you for this case are contending that this case is about Android and only about Android. You recognize that; right?

MR. BYARS: Objection, Your Honor.

THE COURT: Sustained.

Next question.

BY MR. ROCCA:

Q. Your analysis of the Google Play profitability does not include the separate profit and loss statement for Android, which includes over $40 billion in investment; right?

A. It includes the allocated R&D costs that Google has

determined should be on the Google Play P&L.

Q. None of your calculations of Google Play profitability, actual or hypothetical in this case, include any Android costs; right?

A. That's incorrect.

Q. That's not -- you've included the Android costs in your analysis?

A. I said there are Android costs in the calculation of the R&D costs that appear on the Google Play P&L.

Q. But the Android P&L, the $40 billion P&L that sits right next to it, your analysis doesn't include that one; right?

A. Those costs were not allocated to Google Play based on the decision making that Google management determined.

Q. Okay. We'll get to that in a little bit.

My final question.

If you could put up Slide 18, Phil.

Now, this is the demonstrative you just put up. Does it look familiar?

A. It does.

Q. Phil, can you please highlight the bottom of the slide which shows the $92 billion? Thank you.

This document is showing that Google Play as of 2020 helped generate $92 billion in value for developers. Do you see that?

A. I believe that's revenue to the developers.

Q. And those revenues for the developers don't show up on Google Play's financial statements. It shows up on the financial statements of the developers that Google supports; right?

A. Presumably it would show up on the financial statements of all of the developers that have apps on Google Play.

Q. Right. And that's value that Google helped third-party developers create through the Google Play Store. That's fair; right?

A. That's not really something I've investigated.

Q. Right.

MR. ROCCA: No further questions.

THE COURT: Okay. Any brief redirect?

MR. BYARS: Just a few brief questions, Your Honor.

REDIRECT EXAMINATION

BY MR. BYARS:

Q. Mr. Barnes, you were asked about the alternative hypothetical profitability.

I think you were observing that counsel for Google was stopping his questions as of 2017. Is it proper financial also to stop looking at the profitability of a company as of the year it actually starts generating profits?

A. No. That didn't make much sense to me.

Q. Okay. So it's not proper to ignore the fact that by 2021, even under a 12 percent commission, Google Play would be

generating $5.7 billion in profits?

A. I agree with that, yes.

Q. To be clear, you agree it's not proper?

A. It's not proper to stop. It's proper to look at the whole picture.

Q. Okay. Thank you.

And you were asked about the Android cost and you were thrown some big numbers, a 40-billion number. Is it proper financial analysis or accounting analysis just to assume that costs that are sitting on one Android P&L could just be moved over to a separate P&L when that hasn't been done in the ordinary course of business?

A. No. That's improper. I mean, those costs, to the extent there's any costs that should be allocated to any other business unit, that would be something that management would determine. And no one has ever presented any calculation that allocates any of those costs to either Google Play or any other business unit amongst the others that may or may not utilize the Android ecosystem.

MR. BYARS: Thank you, Your Honor.

THE COURT: Okay. You may step down. Careful on the way down.

THE WITNESS: Thank you, Your Honor.

(Witness excused.)

THE COURT: Who do we have next?

MR. ROCCA: Your Honor, Google calls Professor Doug Skinner.

THE COURT: Stand up for a second and stretch. We'll take our morning break at 10:45. Is that okay?

(Pause in proceedings.)

THE COURT: Okay.

THE CLERK: Please raise your right hand.

<u>DOUGLAS SKINNER</u>,

called as a witness for the Defendant, having been duly sworn, testified as follows:

THE WITNESS: I do.

THE CLERK: Thank you. Please be seated.

Please state your full name for the Court and spell your last name.

THE WITNESS: Douglas Skinner, S-K-I-N-N-E-R.

THE CLERK: Thank you.

<u>DIRECT EXAMINATION</u>

BY MR. ROCCA:

Q. Good morning, Professor Skinner.

Where are you currently employed?

A. At the University of Chicago, Booth School of Business.

Q. I'm going to put up a demonstrative to get us through your background more efficiently.

What is your role at the University of Chicago, Booth School of Business?

A. I am deputy dean for faculty and a professor of accounting.

Q. What types of courses do you teach at the University of Chicago?

A. I teach a range of courses in accounting and finance. So financial accounting, financial statement analysis, corporate finance, valuation, Ph.D. classes in research methods in corporate financial reporting, and most recently I teach managerial accounting in our executive MBA program.

Q. What is managerial accounting?

A. Managerial accounting has to do with the use of various types of accounting and financial information within companies in various ways to make management decisions.

Q. Does managerial accounting differ than financial accounting?

A. Yes, it does.

Q. How so?

A. Financial accounting has to do with external reporting in the financial statements that are reported, for example, in SEC filings. So the external financial statements have to comply with a very specific set of rules known as general accepted accounting procedures or GAAP.

Q. Before the University of Chicago, where were you employed?

A. I was at the University of Michigan, Ross School of Business.

Q. What was your role there?
A. I was also a professor of accounting there.
Q. Professor, how many years of accounting experience do you have?
A. I have something over 40 years of experience in accounting.
Q. And briefly what's your educational background?
A. I have a Bachelor of Economics with first class honors specializing in accounting and finance from Macquarie University, as well as a Master's of Science and Ph.D. concentrating in accounting and finance from the University of Rochester.
Q. I notice you have an accent. Are you from Australia?
A. Yes, I am.
Q. Okay. Do you have any real-world business experience outside of the academic arena?
A. Yes, I do. I started my career in Sydney with Coopers & Lybrand working as an accountant or as an external auditor.

More recently, the last four years, I have served on the board of trustees and as chair of the Audit Committee of Harbor Funds ETF, which is an investment complex that manages around 45 billion of assets.

MR. ROCCA: Your Honor, Google offers Professor Skinner as an expert in the subject of accounting.

MR. BYARS: No objection.

THE COURT: He is qualified on that topic.

BY MR. ROCCA:

Q. What is your assignment in this case?

A. I was primarily asked to review and respond to the opinions of Mr. Barnes.

Q. Did you listen to Mr. Barnes' testimony a short time ago?

A. I did, yes.

Q. Do you agree with that testimony?

A. No, I do not.

Q. Let's talk about the areas of disagreement and focus on your opinions. We have a demonstrative here to make this more efficient.

Please tell the jury, what is your first opinion?

A. My first opinion is that Epic and Mr. Barnes overstates the profitability of Google Play.

Q. And why do you believe that Epic and Mr. Barnes overstate the profitability of Google Play?

A. Primarily because Mr. Barnes' analysis and measures of profitability exclude the costs of the investments that Google has made over the years in Android.

Q. What is the result of Mr. Barnes' excluding those Android costs from the profitability analysis he just presented?

A. It causes the profitability measures to be overstated.

Q. What is your second opinion?

A. The second opinion is that Epic and Mr. Barnes claim that

Google Play's profitability is high, as they call it, is misleading.

Q. Why is it misleading?

A. Primarily because Mr. Barnes relies on the management, the internal management P&Ls, that we've already heard about this morning, for example, from Mr. Cramer. And those internal management P&Ls were not designed to and do not reflect all of the costs that are necessary to sustain the Play business.

Q. What is a management P&L?

A. A management P&L is an internal P&L that's used by a company internally for different purposes.

Q. Does this management P&L relate to the kinds of courses that you described teaching in your current job at the university?

A. Yes, it does.

Q. How so?

A. Whereas, I mentioned before for the last several years, I taught managerial accounting in our executive MBA program, managerial accounting is all about the use of different types of accounting data, including cost data, within companies to make different types of business and management decisions.

Q. And, again, why is Mr. Barnes' reliance on a management P&L misleading in this case?

A. Because the internal management P&L, as we heard, for example, Mr. Cramer say already this morning, were intended for

the Play management team to manage their own business. As a result, these were not what we might think of as full financial P&Ls that were designed to capture all of the relevant costs.

Q. So let's show the broader context. I know you have a demonstrative. Please briefly explain, what is this showing?

A. So this is what we might like to think of as the context in which Play operates and in which the Play management P&Ls would be used and interpreted by management, including senior management of Google.

So at the top, of course, we have Alphabet. Alphabet reports three different business segments as we call them. We see on the left Google Cloud, on the right we see the Other Bets segment, and in the middle we see Google Services.

Q. Why do you have Google Services highlighted in dark blue?

A. Because the case here is primarily about Google Play, and so Google Play sits with Android and other products as part of the platforms and ecosystems product area, which in turn is a part of the Google Services segment.

Q. Why is this structure relevant to your opinion?

A. Because this structure provides the context -- and we heard Mr. Cramer use that term -- the context within which we can understand how Google Play operates, including its financial information.

Q. Have you seen evidence in this case that supports your view that Google Play and Android should be viewed together in

context and not in isolation?
A. I have, yes.
Q. I'm showing you trial testimony from Mr. Pichai, who's the CEO.
You've reviewed this testimony; right?
A. I have, yes.
Q. Can you start with the first question and answer and describe to the jury why this testimony is relevant to your opinion?
A. Sure. So if we just look at the first question and answer as you mentioned, Mr. Pichai is asked about the costs of Android. So what he is conveying in his answer is, as we can see, that Google invests billions of dollars a year in Android, including in research costs and engineering development costs, go-to-market costs, and he indicates that it's a significant and substantial investment.
Q. Have you seen data in this case as to how significant and how substantial Android's investment is?
A. I have, yes.
Q. I'm showing you another demonstrative. What is this?
A. This is showing us information on the cost, the total cost, through 2021 of the investments that Google made in Android. So as we can see, that cost is in excess of $40 billion.
Q. Now let's go back do the second part of Mr. Pichai's

testimony.

Why is the second part relevant to your opinion?

A. The second part is relevant because, as we can see here, Mr. Pichai is asked whether the investments in Android help Play succeed; and he says, "Yes, Play wouldn't be possible without the investments in Android." So those investments that Google makes in Android are really critical to the successful operation of Play.

Q. Professor, should the investments in Android be considered when assessing the profitability of Google Play?

A. Absolutely, yes.

Q. If they are included, what would be the effect on Google Play's profitability?

A. Well, if we were to include those substantial costs of Android, those would reduce substantially the reported profitability or the measured profitability of Play.

Q. Have you prepared a series of demonstratives to help explain this basic concept to the jury?

A. Yes, I have.

Q. Let's go through this briskly. What is this first slide showing?

A. This is showing an example, I'm calling it the A1 Camera Company, and we're going to start out, it has a single product, which is a digital camera.

Q. You now have a profit and loss statement. What is this

showing?

A. So this is a profit and loss statement, or a P&L as we call it. It just conveys at the top line here we have the revenue that the product has earned during this period of a million. We're substracting operating costs of 600,000. That then allows us to obtain a measured operating profit here of 400,000.

Q. And from that, how do you calculate the operating margin?

A. The operating margin is calculated by taking that 400,000 of operating profit and dividing by the top line, the revenue of a million, and gives us a 40 percent margin.

Q. You've now adjusted your example. Please explain what you've done.

A. Yeah. So here I'm just introducing a second product, a wearable camera.

Q. And you've added an R&D item at the bottom of $200,000. What is happening here?

A. So what I'm denoting here is that as part of the example, the company incurs research and development, or what we call R&D, costs in this case of $200,000. Those R&D costs are incurred to, for example, develop technology or intellectual property, IP, that supports both of the products, the digital camera and the wearable camera.

Q. The words "R&D cost center" are on the bottom right. What is a cost center?

A. A cost center is, if you like, a business unit or a P&L that simply tracks costs associated with a particular type of activity; in this case, research and development.

Q. Why would a company set up a cost center?

A. Well, because a couple different reasons, but one is primarily so they can track the costs of a certain type of activity. Again, in my example, that would be the research and development activity.

Q. Is there anything unusual about setting up a cost center as you've shown in this example?

A. No. Companies use cost centers all the time.

Q. Now let's go back to the P&L and see what happens with your example.

What is shown on the screen now?

A. So what I'm showing on the screen now is that same P&L. So we see the same million dollars of revenues. We have the same 600,000 of operating costs, but now what I'm showing is that the R&D costs of 200,000 are part of the 600,000 in operating costs.

If I deduct, again, the total 600,000 of operating costs, I have the same operating profit of 400,000, the same operating margin of 40 percent.

Q. Now you have three new P&Ls instead of the single old P&L. Please briefly walk through what's shown on the screen.

A. So what I'm now showing you is with a new structure, so

now we have two products, so the company's internal management P&Ls, if you like, are shown in orange in the right three columns, those right P&Ls. So we have a P&L for the digital camera product, we have a P&L for the wearable camera product, and then we have a separate P&L for the R&D cost center.

Q. We've highlighted the R&D cost at $200,000. Can you please explain where that $200,000 moved from and where it landed?

A. So when we just had the single product company, the P&L shown in the blue on the left, we had the R&D costs, as I mentioned before, as part of the operating costs. Now that we have a multiproduct company, the company is tracking those R&D costs in a separate cost center. So that 200,000 has moved into the column on the right, the R&D cost center; and as a result, it's no longer shown in the P&L for digital camera.

Q. So now let's look at the digital camera's new P&L after moving the $200,000 into a cost center. Please explain to the jury what happened.

A. So as we can see, if I move that 200,000 out of the digital camera P&L and now are tracking that cost in the cost center, that 200,000 has been removed from the operating cost of the digital camera, so we have the remaining operating costs of 400,000. So that P&L -- P&L now shows a higher operating profit of 600,000, and now the operating margin looks higher. We see the operating margin has gone from 40 percent up to

60 percent.

Q. And it's gone up, Professor, even though the revenues for the product stayed the same?

A. Yes, the revenues are the same.

Q. Okay. How does this slide fit into your criticism of Mr. Barnes?

A. Well, the problem with what Mr. Barnes has done in his analysis is he focuses in isolation on the digital camera P&L that we've shown in blue. So he's looking exclusively at that 60 percent margin without presenting the full context, which is the whole set of P&Ls that the board and the senior management team would be looking at.

Q. So let's apply this example to Android and Google Play.

Back to your context slide, you've added a green box here. Can you please explain to the jury what you've done.

A. Sure. This, again, is a slide we saw before and, again, this is the context in which the senior management, the board, and others at Google understood the business that they were running.

And so what I'm showing, again, down the bottom here are the various components of what they call the platforms and ecosystems group. And so we see Android. We see Google Play. And as I've already mentioned, and as Mr. Cramer talked about, the Android costs are tracked in a separate P&L, which is largely costs, almost exclusively costs. Those costs are not

allocated to any of the other products, including to Play. So this is analogous to the R&D cost center in my camera example.

Q. Professor, why would it make sense that the Android costs are not allocated?

A. A couple different reasons. One is it just makes sense if you want to track the costs of a particular activity, like R&D or in Google's case the Android costs, you would track them in a separate P&L, which is essentially a cost center.

The other reason is that these costs benefit the entire ecosystem, so a whole set of different products, and it just doesn't make sense. You know, in managerial accounting, we call this a joint cost as opposed to a shared cost because that cost benefits all of the different products simultaneously essentially. It's just not sensible to do an allocation, and it's not at all uncommon for companies not to allocate those types of shared or joint costs to individual products or product areas.

Q. And, again, what is the magnitude of the Android costs that were not allocated here?

A. So as we've already seen, those costs were in excess of $40 billion through 2021.

Q. Now, what's the orange box?

A. So the orange box is showing that in addition to the Android costs, there are a bunch of other what we will call shared or indirect costs that are not fully allocated into the

Google Play P&L. And so those costs are also not reflected in the Google Play P&L, but are understood by management as costs of the entire ecosystem or the business as a whole.

Q. What is an example of a shared cost that does not appear in the Google Play P&L?

A. So one very prominent example might be the cost that Google has incurred almost from its inception in making investments in the brand. The Google brand is one of the most valuable brands in the world. It's worth I think around $200 billion. And the costs of the investments that are necessary for Google over the years to develop that brand are not allocated to the different products or product area. They are certainly not fully allocated to those different product areas for the reasons I mentioned before.

Q. Now, Mr. Barnes' testimony suggests that because Play's management P&L is relied upon by Google's senior leadership, that it must be reliable. What is your response to that?

A. I think it's misleading.

Q. Why?

A. Because although the Google Play financials, those internal management P&Ls, are -- as Mr. Cramer said, they're reliable, they're accurate, they're only reliable and accurate for the purpose that was intended, which was for specific internal purposes.

So what's misleading about that is that it ignores the

context that we've mentioned, which is that senior management and the board, Ms. Porat, Mr. Pichai, and others at the top of the company, fully understood the context that's represented on this slide and that there were a bunch of costs, including the Android costs, that are not reflected in that internal management P&L.

Q. Have you seen financial information relating to the platforms and ecosystems level of this organization?

A. Yes, I have.

Q. Our last slide. There are two bar charts. Can you please explain to the jury what's on the left?

A. Sure. What's on the left is the operating margin for Google Play for 2020 as calculated by Mr. Barnes.

Q. And what is on the right?

A. On the right is the operating margin for the platforms and ecosystems product area again for 2020, and that shows a much lower number of 19 percent.

Q. And why, Professor, is the number on the right so much lower than the number on the left?

A. Well, primarily because the number on the right reflects all of the different costs that are necessary to sustain the ecosystem. So that would reflect, for example, the Android costs that we've been talking about.

Q. Professor, are you saying that the 19 percent number is the precise operating profit that should apply to Google Play?

A. I'm not, no.

Q. Can you just explain that?

A. Sure. What I'm saying is, again, my opinion is that the 66 percent number that Mr. Barnes has presented for 2020 overstates the profitability of Google Play. And if we were to account for all of the relevant costs, which would include the Android costs that we've talked about, the actual operating profit margin that we would think about for Google Play would probably be closer to the 19 percent than it is to the 66 percent.

Q. And, finally, back to your opinion. Remind the jury, what is your first opinion?

A. My first opinion is that Epic and Mr. Barnes overstate the profitability of Google Play.

Q. And your second opinion?

A. Is that Epic and Mr. Barnes claim that Google Play's profitability is high, as they call it, is misleading.

MR. ROCCA: Pass the witness, Your Honor.

MR. BYARS: May I proceed, Your Honor?

THE COURT: Yes.

MR. BYARS: Thank you.

CROSS-EXAMINATION

BY MR. BYARS:

Q. Good morning, Dr. Skinner. Good to see you again.

Now, we spent some time covering your academic

credentials. I just want to clarify a few things first.

You don't have a CPA; right?

A. That's correct.

Q. You're not a certified public accountant; right?

A. That's correct.

Q. And you spent about two years working at an accounting firm; right?

A. That's right.

Q. That was right after you graduated high school?

A. That's right. In Australia at the time you could go to college at night and work at the same time as -- so I worked in -- during the day as a CPA and --

Q. Sir, I'm sorry. Interesting story, but we need to be efficient. I'm on a clock here. I just want an answer to my specific question, please. Thank you, though.

Other than that, you've never practiced as a professional accountant; right?

A. That's correct.

Q. And apart from teaching, you also often give expert testimony in cases like this one; correct?

A. I do give expert testimony, yes.

Q. 15 to 20 times at least; right?

A. That sounds about right, yes.

Q. Okay. And you saw Mr. Barnes' testimony. You must have seen his testimony that Google Play generated a 71 percent

profit margin in 2021; correct?

A. That's his opinion, yes.

Q. Okay. Understood. That's his opinion.

MR. BYARS: Can we show that, Ms. McGuire?

Ms. Clark, would you mind giving us control? Thank you very much.

BY MR. BYARS:

Q. And you also saw his opinion that Google Play generated $12.6 billion in operating income in 2021; correct?

A. Yes, based on that internal management P&L data.

Q. Understood. That is what his testimony was; correct?

A. (No audible response.)

Q. And you'll have to answer verbally instead of nodding.

A. Yes.

Q. Thank you very much.

Now, you didn't calculate Google Play's profit margin; correct?

A. I did not. I was not asked to calculate Google Play's profit margin.

Q. Google didn't even ask you to determine what the Google Play profit margin was; right?

A. I was not asked to do that, and there are good reasons for that.

Q. I just want an answer to my question.

They did not ask you to do that; correct?

A. That's correct.

Q. Okay. And they also didn't ask you to calculate the operating income for Google Play in 2021 or any other year; correct?

A. That's correct.

Q. Now, we saw a lot of slides where you calculated various hypothetical profit margins for your fictional camera company; right? That was part of your direct?

A. Yes.

Q. Okay. But you didn't do that for Google Play, the business that's actually under consideration in this case; correct?

A. That's correct. The camera example was designed to explain how companies might have --

Q. I think we heard that on direct. I don't need that again. I appreciate it, but I just want to get the answer to my question.

You didn't do any of those calculations for the company that we're actually here today to talk about; correct?

A. Those calculations are reflected, for example, in the platforms and ecosystems number that we saw.

Q. But the platform and ecosystems number, I think as you just testified, is not the operating margin or operating income for Play; correct?

A. Not as reported on the internal management P&L, but that,

as I said, ignores the full context that management understood.
Q. Sir, I just want an answer to my question.
The platforms and ecosystems profit margin and operating income is not Play; right?
A. It includes Play. It includes --
Q. It is not Play, though; right?
A. It is not specifically Play, no.
Q. You didn't do any calculations for Play; right?
A. That's correct.
Q. Okay. Now, you had an org chart where you went through the various levels. The top level was Alphabet, so let's talk about Alphabet profitability.
That's the Google parent company; correct?
A. Correct.
Q. And you don't know, despite your academic credentials, how to evaluate whether that parent company makes significant profits; correct?
A. We know from the annual report, the 10-K how much the company reports externally according to its GAAP financials. Yes, we know some -- its profitability from there.
Q. Okay. I appreciate that information, but you personally do not know how to valuate whether that amount of profits is significant; correct?
A. Well, I think my expertise includes financial analysis, and certainly I'm able to evaluate the significance of profits

for any company, including Alphabet.

MR. BYARS: Your Honor, I'd like to use in his deposition page 55, lines 3 through 8.

THE COURT: 3 through 8?

MR. BYARS: Yes, sir.

THE COURT: It's not, sir.

MR. BYARS: I'm sorry. Apologies.

THE COURT: Okay. I think I gave back that binder. Do you have -- can you hand it up to me?

Oh, wait. I'm sorry. 3 through 8. Okay.

MR. BYARS: Page 55, 3 through 8.

THE COURT: All right. I don't have the right one.

What date is it? Is there more than one deposition for him?

MR. BYARS: There should only be one deposition in the binder. There may be a different deposition of another person that we may use.

THE COURT: Page 3?

MR. BYARS: Page 55, lines 3 through 8.

THE COURT: 55. Oh, okay.

(Pause in proceedings.)

THE COURT: That's fine.

BY MR. BYARS:

Q. Sir, if you look at the screen, you were asked the question; correct (as read):

"Let's focus on Alphabet, the company as a whole. Alphabet earns significant operating income; correct?"

And you answered (as read):

"I don't know how to evaluate what might be significant."

Were you asked that question and did you give that answer?

A. I did give that answer, yes.

Q. Okay. Thank you, sir?

A. And that was not the complete answer.

Q. You'll have the opportunity if they want to clear something up. I just want the answer to the question.

Let's look at -- and you mentioned that Alphabet does, in fact, report its operating income to the public and investors; correct?

A. Correct.

Q. And, for example, in 2022, Alphabet reported over 74.8 billion in operating income; correct?

A. I don't remember the 10-K number offhand, but I will take your word for it that that's the number reported on the 10-K.

Q. Okay. Good enough.

That's the number that you didn't know how to evaluate whether that represented significant profits; correct?

A. Again, I was asked a specific question, yes, I gave the answer I gave.

Q. Okay. Understood.

Now, one step down on your organization chart was the services segment; correct?

A. Correct.

Q. And services includes Play; correct?

A. Services does include Play.

Q. Services also includes Android?

A. It does.

Q. It includes all the costs that you've testified are associated with Android; correct?

A. It does, and it includes the ad business and the Search business and everything else.

Q. And many other businesses too; right?

A. Correct.

Q. And in 2022, for example, the services segment, as reported in the 10-K, generated 86.6 billion in operating income; right?

A. That sounds right, yes.

Q. So, in fact, the services segment that includes both Play and Android made more profits than the company as a whole; correct?

A. Correct.

Q. Now let's talk about a level down in the internal Google Play P&Ls.

Now, you're not saying those are completely useless; right?

A. No. As Mr. Cramer testified, they're used primarily by the managers of each different product, so including for Play, to manage their businesses. So, no, they were used for the purposes intended, which was for the management teams to manage their businesses.

Q. Okay. In fact, the Play P&Ls are used for some pretty important business purposes within Google; correct?

A. I believe so, yes.

Q. By design, those P&Ls provide Google managers with insight into their respective businesses; correct?

A. Yes. And I would say, you know --

Q. That's all --

A. -- we have to be careful of using managers because there are managers at a whole bunch of different levels within the organization that would use the data differently.

Q. Okay. Let's look at a specific person then outside of Google Play, the CFO, Ruth Porat.

Ms. Porat testified that the P&Ls were used for trends analysis; correct?

A. I don't recall specifically. That sounds like something she might have testified to.

Q. Okay. And she also testified that they were used to gauge opportunities or issues for the businesses; correct?

A. That -- again, I don't recall her testimony word for word, but that sounds like it might be correct.

Q. Well, did you recall quoting that testimony in your expert report, sir?

A. I quoted her testimony in a number of different places so, yes. I don't recall the exact words, but that sounds like.

Q. It sounds like something you would have quoted that she said; correct?

A. It sounds like it could be, yes.

Q. Okay. And the Play P&L does include joint costs that have been allocated to Google Play; correct?

A. No. You're using the term "joint costs." I think that we might call them shared costs. Certainly the Google Play P&L includes some allocated indirect costs from high levels in the organization.

Q. Okay. So you aren't testifying that the Google Play P&L is missing all shared costs; right?

A. No. As my report and testimony indicated, there are certainly allocated indirect costs that are reflected in the Google Play P&L.

THE COURT: Okay. We'll take our morning break. We'll be back at 11:00.

THE CLERK: All rise.

(Recess taken at 10:46 a.m)

(Proceedings resumed at 11:04 a.m.)

(Proceedings were heard in the presence of the jury:)

MR. BYARS: May I proceed, Your Honor?

THE COURT: Yes, please.

MR. BYARS: Thank you.

BY MR. BYARS:

Q. Dr. Skinner, I'd like to focus on one of the two main opinions that you've offered. I'm looking at your demonstrative now.

Your second opinion is that Epic's claim that Google Play's profitability is high is misleading. That's one of your main opinions; right?

A. It is, yes.

Q. But it's not just Epic asserting that Google Play's profitability is high; right?

A. Well, that's out of what Epic and Mr. Barnes' opinion is, yes.

Q. But, in fact, folks within Google have also asserted that Google Play's profitability is high?

A. In certain context that may be true, yes.

Q. In fact, they've informed the CFO, the chief financial officer, of Alphabet that Google Play's profitability is high?

A. Perhaps, but perhaps -- are there specific documents you have in mind here?

Q. I'm happy to show you Exhibit 434, which we have in a demonstrative. We can pull it up for you.

This is the Play update@cfocouncil. We saw testimony about this earlier today. You were here for that; correct?

A. I was, yes.

Q. And this was a 2018 slide deck presented to CFO Council; right?

A. That's what I understand this to be, yes.

Q. CFO refers to Ms. Porat. She's the chief financial officer of Alphabet as well as Google; right?

A. She is, yes.

Q. Okay. and the CFO Council also includes other senior finance leaders of Alphabet; right?

A. As I understand it, yes.

Q. Okay. If you look at the slide here, those, the people on that council, were informed that Play was highly profitable with consistently improving margins; right?

A. That's what the slide says; but, again, the CFO Council --

Q. I just want to know -- I just want to make sure that's what this slide says; right?

A. That's what the slide says.

Q. You're not testifying that the folks who presented this to the CFO and senior business leaders were trying to mislead them; right?

A. No, there is no misleading.

Q. Okay. And if you see, this is connected to the 2017 figure here, which is a 52 percent profit margin; right?

A. A 52 percent profit margin including the ads, yes.

Q. Yes. 4/20/17?

A. As reported on this slide, yes.

Q. Okay. And as reported on this slide, that meant to these folks that Google Play was highly profitable with consistently improving margins; correct?

A. That's what the slide says, yes.

Q. Thank you.

I'd like focus on the Android costs you talked about. You have a demonstrative reporting them as 40 billion.

I just want to clear one thing up that may be unclear. That number includes costs going all the way back to 2005; right?

A. It does. The Android --

Q. And that -- 2005, that was before Google Play even existed; right?

A. Correct. Android Market preceded Google Play, and then --

Q. But 2005 was even before Android Market; right?

A. Correct. I believe that was the time of the initial investment into Android.

Q. Okay. And you cannot say that any of that 40 billion in Android costs should necessarily be allocated to the Play P&L; right?

A. Allocation is a specific accounting terminology.

Q. I just want to know whether you're able to give an opinion that any amount of that 40 billion cost should necessarily be allocated to Play.

A. Well, again, we need to understand that, as Mr. Cramer said and as I've seen other testimony, that $40 billion in Android costs, we saw Mr. Pichai's testimony that that was necessary to support the Play.

Q. I don't want to talk over you for the benefit of the court reporter, but I don't think you're answering the question I'm asking you.

I just want to know: Can you give any opinion that any amount of that 40 billion cost should necessarily be allocated to Play?

A. If we wanted to get a full picture of the --

THE COURT: Mr. Skinner, I need you to say "yes," "no," or "I don't know." Okay?

Ask the question again, please.

BY MR. BYARS:

Q. Can you give an opinion that any of those Android costs should necessarily be allocated to Play?

A. Yes, I think some of them should be.

MR. BYARS: Okay. Your Honor, may I use in his deposition page 146, lines 6 through 16?

(Pause in proceedings.)

THE COURT: Yes.

BY MR. BYARS:

Q. Dr. Skinner, you were asked the question, and I apologize for this preface (as read):

"And for one more time, indulge me, revisiting the Android investments that in your opinion ought to be allocated to the Play P&L, have you attempted to determine what allocation mechanisms would be reasonable to determine the portion of those investments that should be allocated to Play P&L?"

And your answer was (as read):

"Let me be clear about the conclusion in my report, which I hope is clear as it's written, which is I'm not necessarily opining that those Android costs should be allocated."

Were you asked that question and did you give that answer?

THE COURT: That part is already carved in stone. He was asked the question and he gave that answer. You don't have to say that. Okay?

MR. BYARS: I appreciate that, Your Honor. Thank you.

THE COURT: You can just move on. All right?

MR. BYARS: Thank you, Your Honor. I appreciate that.

THE COURT: That's a tip for everybody. You don't have to say "Is the sky blue?" All right? We all know that. Okay. Go ahead.

MR. BYARS: Thank you.

BY MR. BYARS:

Q. And, furthermore, in your opinion, it's unlikely at least that all of the Android costs would ever be allocated to Play

as opposed to one of Google's other businesses; right?

A. The Android costs collectively support the entire ecosystem, including Play and the other products.

Q. Sir, that's an entirely different question that I think you're answering other than mine.

It is unlikely that you would ever be allocating all of those Android costs to Google Play as opposed to one of Google's other businesses; right?

A. That's correct. You wouldn't be allocating all of them necessarily.

Q. And, in fact, you haven't calculated the portion of those Android costs that you think should be allocated to Google Play; right?

A. Well, I think I've made clear that at least a portion of those costs is necessary to support the ecosystem, which includes Play; and so a full picture of the --

Q. Sir, I'm asking you the question --

A. If I could just finish.

The full picture of the profitability of Play would reflect those costs.

Q. Sir, this is my time. I asked you a specific question about whether you had calculated the amount of Android costs that you believe should be allocated to Play. You have not done that; correct?

A. Correct.

Q. Thank you.

And if you were to engage in a hypothetical exercise to allocate Android costs, you would need to allocate those costs to each of the different business units within Google that benefit from those costs; right?

A. It would depend on the purpose.

Q. Let me ask it again.

If you were to allocate Android costs, you would need to allocate a portion of those costs to each of the different business units that benefited from Android costs, not just Play; right?

A. Again, I think we heard Mr. Cramer say today that --

THE COURT: Mr. Skinner, please. Just say "yes," "no," or "I don't know."

Let's have the question again, please.

MR. BYARS: Sure. I'll ask it a different way.

BY MR. BYARS:

Q. If you're preparing P&Ls for different business units within an organization and more than one of those business units benefits from costs, you would need to allocate some portion of those costs among all of those business units that benefit; right?

A. You would often do that, yes.

Q. In fact, you would need to do that; right?

A. It depends on the purpose.

MR. BYARS: Your Honor, may I use his deposition page 230, lines 7 through 22?

THE COURT: 230?

MR. BYARS: Yes, Your Honor.

(Pause in proceedings.)

THE COURT: That's fine.

BY MR. BYARS:

Q. So the question was (as read):

"To be more precise, for most purposes, if you were asked to attribute Android costs to Google Play as part of analyzing the Play Store's profitability, do you agree that you would also need to, as part of the analysis, attribute those Android costs to other Alphabet businesses that benefit from Android investment?"

The answer was (as read):

"So I guess I'll say it in the following way and make a general statement. If I'm preparing P&Ls for different business units within an organization and those different business units each benefit from a given indirect cost, in many instances we would be allocating some portion of those indirect costs to each of the different business units."

That was your answer?

THE COURT: Just go.

MR. BYARS: Thank you, Your Honor.

BY MR. BYARS:

Q. And it is true that the Android ecosystem includes multiple other products than Play; right?

A. It does include a set of products, yes.

Q. Multiple other products other than Play; right?

A. A number of products.

Q. Okay. And the businesses that may benefit from Android could include Google's Search business; right?

A. Well, the Search business sits outside platforms and ecosystems, but potentially it could benefit them.

Q. Search could benefit from the Android ecosystem; right?

A. It could, yes. I'm not an expert on Search.

Q. Okay. YouTube also could benefit from the Android ecosystem; right?

A. It could potentially, yes.

Q. And, for example, the Search business is a much larger business than Play in terms of revenues; right?

A. As I understand it, yes.

Q. Search is a much bigger business; right?

A. It is. It has larger revenues, yes.

Q. But you didn't evaluate the extent to which any of these business units, including the really big one, benefited from Android compared to Play; right?

A. My understanding is that a bunch of different Google products and businesses benefit from Android, yes.

Q. Sir, I'm asking a different question, which is whether you've calculated or conducted any comparison of the extent to which any of these other businesses, including Search, benefit from Android. You haven't done so; right?

A. Correct. Yes.

Q. And in your opinion, there are both costs and benefits that Play experiences as a result of being involved in the Android ecosystem; correct?

A. Yes.

Q. Just one last point that I think we should address, and I'd like to refer you to one of your demonstratives.

Ms. McGuire, if you could put that up.

This is page 8. Sorry. Page 8 in our slide deck.

Thank you.

This was your demonstrative in which you compared the operating margin of Google Play to the operating margin of the platforms and ecosystems area within Google; right?

A. Correct.

Q. But there are lots of other products within what I'll call P&E, platforms and ecosystems, not just Play and Android; right?

A. Yes, there are several other products.

Q. Okay. And, in fact, all of those several other products within P&E are unprofitable businesses with one exception; right?

A. They generally are unprofitable apart from Play, yes.
Q. Apart from Play. Play is that one exception; correct?
A. Correct.
Q. And so it's not Google Play that is pulling down that 66 percent margin to 19 percent; right?
A. No. But, I mean, to be clear --
Q. That's all. That's all. Thank you.
A. Okay.

MR. ROCCA: Two questions, Your Honor.

THE COURT: Go ahead.

MR. BYARS: Sorry. Pass the witness, Your Honor.

THE COURT: Yes. That's fine.

MR. ROCCA: Thank you.

REDIRECT EXAMINATION

BY MR. ROCCA:

Q. That chart that you were just looking at, Professor, do you have it in mind?
A. Yes, I do.
Q. What is the largest source of revenue in platforms and ecosystems?
A. It is Play.
Q. What is the largest source of costs in platform and ecosystems?
A. Android.
Q. So the red bar captures the largest source of revenue and

the largest source of costs in that unit; right?

A. Correct.

Q. And you indicated there were reasons why you didn't calculate Google Play's profits, profitability. Counsel didn't let you finish. Can you just explain the reasons?

A. Yes. Because the questions were specifically about allocations. Now, we know from Mr. Cramer's testimony and other testimony of senior Google executives, that the Android costs, like my example, were not allocated at all, and there were good reasons those costs were not allocated at all.

Q. And, again, what are some of those reasons?

A. Well, because, A, the Android costs were tracked in a separate cost center, which made sense if, as we heard Mr. Cramer say, the managers of Android wanted to keep track of those costs.

And then, secondly, if these are joint costs that benefit a multitude of products, it's common not to allocate those costs to individual product management P&Ls.

Q. Thank you, Professor Skinner for your time.

THE COURT: Okay. You may step down.

(Witness excused.)

THE COURT: And who do we have next?

MR. BORNSTEIN: Your Honor, Epic calls Professor Doug Bernheim.

THE COURT: Let me get the binders.

THE CLERK: Please raise your right hand.

BERT DOUGLAS BERNHEIM,

called as a witness for the Plaintiff, having been duly sworn, testified as follows:

THE WITNESS: I do.

THE CLERK: Thank you. Please be seated.

Please state your full name for the Court and spell your last name.

THE WITNESS: It's Bert Douglas Bernheim. The last name is spelled B, as in boy, E-R-N-H-E-I-M.

THE CLERK: Thank you.

MR. BORNSTEIN: Your Honor, before I begin the examination, as we did with Mr. Barnes, we have a few exhibits to move in in advance without objection for the sake of efficiency.

The exhibits are numbers 6903, 6924, 6931, 6932, 6940, 6941, 6950, and 6952.

MR. RAPHAEL: No objection, Your Honor.

THE COURT: Okay. They're admitted.

(Trial Exhibits 6903, 6924, 6931, 6932, 6940, 6941, 6950, and 6952 received in evidence.)

MR. BORNSTEIN: Thank you, Your Honor.

DIRECT EXAMINATION

BY MR. BORNSTEIN:

Q. Professor Bernheim, how are you employed?

A. I'm a professor of economics at Stanford University where I was also department chair head of the Economics Department for seven years. I'm also a partner at the economic consulting firm of Bates White.

Q. And would you describe your educational background, please?

A. Sure. I have a Ph.D. in economics from the Massachusetts Institute of technology.

Prior to that, I received a bachelor's degree from Harvard University with highest honors.

Q. And how long have you been at Stanford as a professor?

A. Grand total, something like 35 years.

Q. And what specifically is your field of study?

A. I specialize in a number of areas. One of them is known as industrial organization, which is -- which includes competition economics and antitrust.

I also work in a number of other fields. One of the other fields that will come up is behavioral economics.

Q. Have you authored any economic scholarship in these fields?

A. Yes. I've written over 125 academic articles, most in peer-reviewed journals. I've also written two books. One is an undergraduate microeconomics textbook.

Q. Does any of that research relate to antitrust or competition economics?

A. Yes, it does. Some of it concerns monopolistic practices, vertical practices, cartels, those sorts of topics.

Q. And have you previously been qualified as an expert on those issues by other courts?

A. Yes. Multiple times.

MR. BORNSTEIN: All right. Your Honor, I would offer Professor Bernheim as an expert in the field of economics and, in particular, competition and antitrust economics.

MR. RAPHAEL: No objection, Your Honor.

THE COURT: He is qualified.

Go ahead.

MR. BORNSTEIN: All right. Thank you, Your Honor.

BY MR. BORNSTEIN:

Q. Professor Bernheim, do you have a set of slides to help you make it through your testimony today?

A. Yes, I do.

Q. All right. Let's see if we can get those up on the screen.

Can you please summarize the assignment that you were asked to undertake here?

A. Well, the main assignment is listed at the top of this slide. It was to conduct economic analyses of the challenged conduct in this case and to determine its impact both on competition and on market outcomes, and that involved a number of steps, a number of pieces.

The main objective was to determine how Google's conduct or the extent to which it -- whether it obstructs competition. That's the first item.

To do that I had to do several other things. One of them was to identify what are known as relevant antitrust markets. That's a concept that I'm going to be discussing and explaining. That was the second -- that's the second item on the screen.

The next thing is to determine whether Google possesses what's known as monopoly power in those antitrust markets. That's the third item.

And then the final item is to go back to the conduct and determine whether the conduct adversely impacts the customers in these markets, in particular developers and smartphone users.

Q. And so, Professor, what's the bottom line? What did you conclude here?

A. In brief, what I concluded is that Google has monopoly power in the market for app distribution on Android smartphones; that it engages in anticompetitive conduct that sustains and enhances and maintains that power; and that as a result of that, their customers, meaning users and developers, are harmed.

Q. Did you do any writing or author anything that summarized the analysis that you performed?

A. I did. I wrote two reports in this matter totaling over 600 pages.

Q. So before we dive in, and we're not going to do all 600 pages, but before we dive in, I want to just get out there some of the basic economic principles that you applied, and I'll start with -- start with the beginning.

So why do economists care about competition at all?

A. Competition is a core concept in antitrust economics. Competition refers to the process by which companies vie for customers by lowering their prices, by improving the quality of their products. So competition leads to the provision of high-quality products at low prices. It also stimulates innovation. So all of these are benefits for consumers; they're benefits for the economy.

Q. How is it that competition produces all of these good things?

A. I have a demonstrative slide that will allow me to walk through this.

So in this slide I'm depicting, first of all, a transaction between a seller, which is the middle seller here. This is Seller A that has a product or service which it provides to the buyer. The blue arrow is indicating that a transaction is taking place, and that transaction is satisfying a very particular need or desire on the part of the buyer.

Now, what we're concerned about in antitrust economics is

the possibility that a seller might be in a position to take advantage of a buyer by charging higher prices for lower quality products and what limits that ability.

What limits that ability is the presence of other sellers, and here in this diagram I've shown two other sellers. I've labeled them as B and C with gray arrows going to the buyer to indicate that while those aren't transactions that took place, they could have taken place. These are also products and services that could satisfy the same need or desire.

And the fact that the buyer has the ability to switch to one of the other sellers keeps Seller A here in line. Competition between these sellers will produce a good outcome for the buyer.

Q. So is there a name that antitrust economists give to this sort of set of substitutes that you're looking at here?

A. Yes. We call them substitutes, and the substitutes fall into what we call a product market. So we have -- that slide has now added that.

These transactions all fall within the same product market because they're satisfying the same need or desire on the part of the buyer.

Q. And did you look at or attempt to define any product markets in this case?

A. I did. We're going to focus on two of them. One of them involves third-party operating systems for smartphones and the

other involves app distribution on Android.

Q. All right. So using app distribution on Android and the Google Play Store as an example, why is it that an antitrust economist goes through this exercise of defining a product market?

A. Well, when you define a product market, you're determining who the competitors are. You're finding out who can compete. So if we're talking about Android operating systems, you're looking to see who provides the operating systems; Google, for example.

We do that so we can evaluate the competition, the intensity of the competition; and we can also, having done that, evaluate the effect of the conduct on the competition.

Q. Okay. You had said something earlier about assessing whether or not Google has monopoly power. Can you explain what that is?

A. Sure. Let me start with the concept of market power. Economists talk about an ideal called perfect competition. In a perfectly competitive market with tons and tons of competition, prices are competed down to costs.

Now, the term "market power" refers to the ability to set prices significantly above costs. When that power is substantial and when it's sustained, we often refer to that as monopoly power. And that's kind of a funny term because the word "monopoly" literally means one seller, but we don't mean

that when we say "monopoly power." We mean substantial and sustained market power.

Q. And why did you go through the exercise of assessing whether or not Google has monopoly power in any of these markets?

A. Well, we assessed whether Google has monopoly power in these markets to determine whether it has the ability to do what I've described, to charge higher prices and also to engage in anticompetitive practices.

Q. What do you mean by "anticompetitive practices"?

A. An anticompetitive practice is conduct on the part of a company that in some ways interferes with competition, and it can do that either by impairing rivals or it can do that by disincentivizing rivals from competing.

Q. Did you look here and apply that distinction between sort of anticompetitive conduct in the Google Play Store in this matter?

A. I did, and we're going to be talking about that at some length.

But just to kind of give a simple synopsis of what an economist looks like in reaching that judgment, there's a lot that's written on the distinction between pro-competitive and anticompetitive conduct, but there is a simple and intuitive principle that often is a good guide.

And the principle is that if a company is attracting

customers by improving its own offering, making it more valuable to customers, either by improving its quality or by reducing its price, well, that's creating value. That's a good thing. So that's pro competitive.

In contrast, if a company is competing by interfering with its rivals and degrading the quality of the rival's offerings, that is destroying value, and that's typically bad. That would be anticompetitive.

As I said before, providing payments to a rival, for example, not to compete, also would be anticompetitive.

Q. All right. So let's take those principles, apply them to the various issues you looked at specifically here in this case.

So using that framework, what transactions between buyers and sellers did you actually look at?

A. Yeah. It's important to start with the transactions when analyzing competition. So let me begin with one kind of party that participated in those transactions, and these are the smartphone users, the Android smartphone users.

They're going to -- we're going to focus on two different kinds of transactions here and they're related. They're satisfying two different needs. One need is the need for app functionalities on their phones. They want their phones to be able to do certain things.

The other, which is related, is the need for app

distribution. And when I talk about app distribution, what I mean is two things: Discovery, finding the apps; and then installation, actually getting them on the phone so that people can use them. Those are two different needs: The apps themselves and then getting them -- finding them and getting them on the phones.

Q. All right. So let's talk about the first of those, the apps themselves.

Who are the buyers and sellers with respect to that need?

A. The buyers are the smartphone users. The sellers are the app -- are the Android app developers who are providing the apps to the smartphone users. And the yellow arrow here indicates the transaction that's taking place to satisfy the need for apps.

Q. All right. And then for the second need you described app distribution. Who are the buyers and sellers there?

A. Well, here you really have two buyers because there are two parties with a shared need. You've got the users who want apps on their phones and you have the developers who want the users to get the apps on their phones. So they both demand the app distribution services.

Those are provided in transactions with what I'm calling here Android app distribution service providers. So just to take an example of that, Google Play is an app store. That is an app distribution service provider.

Q. And which of the two markets that you have on the screen here right now was the focus of your analysis?

A. The main focus of my analysis with respect to the markets on this screen is the app distribution markets, those that contain the transaction that's highlighted in blue.

Q. All right. We're going to step away from these markets for a second.

Were there any other markets that you also looked at?

A. Yes. In doing this analysis, it was also important for me to think about the Android operating system because that basically is the core of Google's power.

Q. All right. So who are the buyers and the sellers there?

A. Well, here, the buyers are equipment manufacturers. You've probably heard the term OEMs, original equipment manufacturers. They make the smartphones. The smartphone isn't any good without an operating system. So they have a specific need, and their specific need is for the rights to use an operating system.

They obtain that through transaction with another party that provides license to an operating system. So that's -- the arrow in this case is a transaction providing the operating system. So those parties would -- I mean, it's Google Android is an operating system provider.

And these are transactions now that are satisfying different needs and they're with different buyers.

Consequently, they fall within a different antitrust market. So here I'm referring to the market containing third-party smartphone OSs.

Q. All right. How do these markets all fit together?

A. Shown on the slide -- although mine is cut off a little bit. I hope everyone else can see well.

What I've done here is put all the markets that we've just talked about on the same slide, and now I'm going to add one additional arrow that runs from the smartphone OEMs, the folks who make the smartphones, to the smartphone users.

And what's going on in these transactions, which are indicated by that additional arrow, is the smartphone OEMs are providing smartphones to the smartphone users to satisfy their need for smartphones. And that's a different transaction -- different kind of transaction satisfying a different kind of need, so we have to think about a different antitrust market for that as well. And I've described that as markets for smartphones.

Q. All right. Where does Apple and the iPhone fit into all of this?

A. Yeah. So Apple has -- it makes smartphones, but it also has its own proprietary operating system, iOS. It does not offer that operating system to other OEMs. So it's actually not a participant in the market for third-party smartphone OSs. It simply doesn't participate.

Likewise, Apple does not participate in the market for app distribution on Android. Instead, Apple is -- let's add it to the slide -- Apple is down there (indicating). In other words, Apple is creating a phone with its own proprietary operating system and providing that to smartphone users for Android smartphone users. It's an alternative that they could consider.

So this is where Android -- this is where Apple shows up. Apple's presence here in this part of the ecosystem has implications for the rest of the markets that I've talked about, and we're going to need to discuss those in some detail, but this is where they actually interact.

Q. Before we get to any detail, would there be anything wrong with just looking at all of this stuff on top here that's part of -- that relates to Android and saying that that's one big market that competes with Apple?

A. Well, there would be quite a lot wrong with that.

Q. Why is that?

A. Well, you can come at this from two perspectives. One is a bit of a formal perspective of just asking: Okay. There's a framework that antitrust economists use to think about these kind of issues, and it's the framework that I've described. And that framework says: You know, we're looking for -- to see whether there are pockets of transactions where sellers can take advantage of buyers.

To mix all of these things together where you're talking about different buyers satisfying different needs and to lump them all together without distinguishing between them, it is contrary to the principles, the general principles, that there's a wide consensus among antitrust economists. That's not -- that's not how you do competition analysis.

To be, you know, a little bit more practical about this, the issue is that Apple can introduce potentially some competition in this system in the market for smartphones; and while that has implications for what occurs elsewhere in that system, simply knowing that there is competition there does not mean that Google is not positioned to take advantage of buyers in the other transactions that are in this system.

Q. So let's turn back to the specific assignment that you had here.

And can you just give a summary of your main conclusions?

A. To run through it very quickly, the first thing that I concluded is that Google possesses monopoly power in the market for third-party operating systems.

Second, that Google uses that power to deploy a collection of anticompetitive practices.

Third -- which are aimed at app distribution.

Third, that that conduct creates, maintains, amplifies monopoly power in the market for app distribution on Android smartphones.

And then, finally, that the customers, the users -- smartphone users and developers are harmed as a result.

Q. All right. So let's turn to the first one, Google possesses monopoly power in the market for third-party smartphone OSs.

So just to situate it on your little map here, which market are we talking about right now?

A. We put a big red circle around it to just make it clear that this is where we're starting.

Q. All right. And how did you conclude that Google has monopoly power here in this circled market?

A. Well, the first step is to determine who participates in this -- in these transactions as sellers and what are their -- what's the magnitude of their activity. So I have a slide that shows that.

In this slide you can see the date on the bottom axis and on the vertical axis, this is the percentage of units sold. So the percentage of smartphones. The green line is Android. And you can see for third-party smartphone operating systems, Android has basically had close to 100 percent since around 2016-2017. There were other participants in this market, but have sort of died off.

Q. Why is Apple not here?

A. Well, again, as I was describing as were looking at the schematic, Apple doesn't participate in these transactions.

Apple has a proprietary operating system. They don't try and license one from anybody else and they don't offer to license it to anyone else. They kind of wall themselves off.

Q. So, now, is this slide on the screen an Android's share of third-party operating systems sufficient for you to conclude that Google has monopoly power in this market?

A. Not quite. It's a good indication, but that's not where one stops. That's not where an economist stops.

Q. What else did you look at?

A. So I looked at the additional items that are listed on the slide in addition to having nearly 100 percent share. I also examined what are called barriers to entry; in other words, how hard it is -- how hard is it for some other company to come in and start competing with Google even if they're not there now.

Barriers to entry here are extremely high. There hasn't been attempted entry into this market since I think 2014, and that was unsuccessful.

And then the final thing that I looked at was Google's profitability from Android, which I determined was not only substantial but also sustained, and the combination of those things is quite indicative of market power.

Q. There's been some testimony in the case suggesting that Google gives Android away for free. Does that undercut your conclusion regarding monopoly power here?

A. No, it doesn't, because Google doesn't give Google Android

away for free, the Android that's in those figures.

What is correct is that when Google enters these licenses, it doesn't receive a cash payment from the OEMs. But, instead, what it receives is certain contractual agreements, contractual obligations on the part of the OEMs. The OEMs are receiving something and they're doing something for Google.

And one of the very important things that the OEMs are doing for Google is agreeing that they're going to put the suite of GMS apps on their smartphones, and that generates billions of dollars of revenue for Google.

Q. And by "GMS apps," you mean things like Search and YouTube and Maps and so forth?

A. Yes. Those kind of apps, yes.

Q. Aside from the apps, are there any other value that Google gets from the OEMs in licensing Android?

A. Yes. Google also derives value from other aspects of its agreements, its licensing agreements, in relationships with the OEMs. We'll talk about some of them later. They involve the anticompetitive restrictions that I'm going to be focusing on.

Q. All right. Well, why don't we turn to that now in your second conclusion, that Google uses its power in that market we just talked about to engage in a collection of anticompetitive practices that protect the Google Play Store.

And you list on this slide two different types of conduct. Can you explain what they are, please?

A. Sure. The first one is conduct that impairs potential rivals' ability to compete by degrading their offerings basically.

The second is basically just paying a rival not to compete.

Q. All right. And just to situate what we're talking about here on your map, again, we're talking about anticompetitive conduct in which of these markets?

A. Well, now it's the -- I can't say "circle" anymore -- the odd-shaped thing that's encompassing the transactions that I've described as transactions for app distribution services.

Q. Okay. So you talked about one of the types of anticompetitive practices was impairing or obstructing rivals' ability to compete.

What are the specific ways that Google actually does that?

A. So we're going to talk about three ways that Google is doing that that are listed in the three bullet points, the subbullet points here under this first point.

The first of those is impairing direct app distribution by imposing frictions on off-Play installations of apps.

Q. All right. Well, why don't we just dive right into those, and we can take them one by one as we get to them.

So the jury's heard a lot about the frictions from direct downloading of apps.

I want to ask you something that we haven't gotten to yet,

which is have you done any quantitative analysis to assess what the impact of those frictions is?

A. Yes, I have.

Q. What kind of work did you do on that?

A. I did a couple of things. The first of those was to look at what Epic calls its funnel data for installations.

Q. So can you explain, you know, what we're seeing on this slide here about the funnel data?

A. Sure. So this is describing the installation process of EGA, the Epic Games app, followed by Fortnite, and that involves a number of steps that are listed along the bottom axis here. So, you know, they're numbered and then under each one is a little label saying what it is.

On the vertical axis, I'm measuring number of people. And this particular figure applies to a particular month, a single month in 2021. I've looked at data for other months in '21 and -- 2021 and 2022. They all look very similar.

In any case, what I'm focused on here is moving between steps 2A and 3. That's the focus because that's where the warning messages show up, the messages that could potentially alarm a user and induce them to drop off.

And what you see in this figure is that about 35 percent of users drop off averaged across months when they encounter these warnings.

Q. Did you do any other quantitative assessments of the --

THE COURT: Can I jump in?

MR. BORNSTEIN: Of course, Your Honor.

THE COURT: So, Professor, so when you -- the click to download means a user has just initially expressed interest in downloading the app and then portal heartbeat means a successful completed download?

THE WITNESS: Well, remember this is EGA followed by Fortnite. So this is first clicking to download EGA and then the warning message comes up; and then if they click "Yes, please install," it installs EGA and now the process continues to install Fortnite.

THE COURT: What does portal heartbeat mean?

THE WITNESS: I can't remember. I think it's just that they're getting a signal back from the device saying that it's installed.

THE COURT: It's finished? Its successful?

THE WITNESS: For the EGA part, that's -- I think that that's roughly correct.

THE COURT: Okay. Thank you.

Go ahead. Sorry.

MR. BORNSTEIN: Thank you, Your Honor.

BY MR. BORNSTEIN:

Q. So aside from this assessment of the funnel, as you called it, or as Epic called it, did you look at any other quantitative measurements of the impact that the sideloading or

direct downloading frictions and warnings have?

A. Yes. I also looked at an episode involving One Store, which is an OEM, in providing smartphones in India. And I think you heard testimony that there was a period of time where One Store was not constrained by its agreements with Google. There was an ability to provide -- to preinstall the Epic Games app on certain phones in India.

And during that period of time, I was able to look at what happened on smartphones, OnePlus smartphones in India, where the EGA was preinstalled and where it was not preinstalled.

And what you see is that relative to the phones where it was not preinstalled, when you get to the preinstallation period, downloads of Fortnite increase by about 75 percent.

Q. So when the EGA app was able to be preinstalled, you're saying that downloads increased; is that correct?

A. Downloads of Fortnite increased quite substantially, yes.

Q. And just so the record is clear, at some point in that answer you referred to One Store and at some point you referred to OnePlus?

A. Sorry. OnePlus.

Q. Okay. Great. Thank you.

A. Yes. I meant OnePlus in both cases.

Q. Great.

There's been some testimony in this case from a representative from Amazon who said that only about 11 percent

of users who attempted to download the Amazon Appstore at one point actually made it all the way through the process. Is that consistent with your analysis?

A. Yes, it's consistent, it's corroborative of what I'm finding.

Q. All right. So after reviewing that and the other materials that you've seen in this case, what did you ultimately conclude about the impact of these frictions and warnings on the competitive significance of direct downloading?

A. Well, by degrading the quality of the download experience, at least to the extent that's shown here, I mean, it may be greater if people are having a bad experience here, they may get uncomfortable with the process, drop off later; they may do it once, not try it again. So this is kind of a lower bound on the impact.

But my conclusion here is that this process is degrading one of the important competitive alternatives to Google Play; and because it does that, it will enhance Google Play's power in the market for app distribution.

Q. Let's talk about another way that a competing app store might compete.

Are there other ways that an app store can get onto a phone aside from being directly downloaded by the user?

A. Yes. The other way that an app store can get on a phone is through preinstallation.

Q. All right. And did you look at whether Google's conduct affects the competitive significance of preinstallation as an option?

A. I did. Google also has conduct that impacts the feasibility of preinstallation.

Q. All right. Before we get to what Google actually does, just can you explain why preinstallation matters, what its competitive importance is?

A. Sure. So to start with, Google Play is preinstalled on all Android phones. So it's there. It's a potential default. And we know from research and behavioral economics, one of my areas of specialization, that defaults can be extremely powerful; that if there is a default, that people tend to stick with it unless they have a compelling reason to do something else.

Now, that means that if there is no preinstallation of anything else, Google has an enormous advantage.

Q. So did you look at how well or poorly other app stores have succeeded in being able to get preinstalled?

A. I did. And I think we have a slide that shows this.

Q. All right. Can you tell us what we're looking at here?

A. So this is a slide that's summarizing preinstallations as of July 2021, and you can see that it basically has three pieces to it. The top is Google Play. That's just to remind you that Google Play is preinstalled on 100 percent of Android

smartphones.

The rest of this is divided into two sections, and I want to start with the section on the bottom to begin with. These are the non-OEM stores. And by looking at the final column, those are shares, those are shares of phones that they're preinstalled on, you can see that they're all very tiny. All but one are significantly less than 1 percent.

So the non-OEM stores have not been able to achieve any success with preinstallation.

Now let's look at that panel that's kind of shaded yellowish which says "OEM Stores." This is where you see some significant preinstallation.

So, first of all, Galaxy Store worldwide is on about 40 percent of Android smartphones. And then there are some others, some other OEMs, that also have nontrivial installations, in particular Xiaomi, Vivo, and Oppo.

Q. And you've got some that are grayed out. Just quickly, why did you gray some out?

A. I grayed two of them out. I grayed out Huawei and LG. And the reason is, first of all, LG stopped making smartphones in 2021. So they're not part of this picture anymore.

With respect to Huawei, Huawei ran afoul of sanctions I think in 2019, and those sanctions made it impossible for Google to do business with them so they lost access to, you know, Google products and suffered from other sanctions as

well, and their market share kind of collapsed after that. Outside of China their market share collapsed.

Q. So if you do some rough math here, on the right column in the yellow there's, you know, around 50 percent of the stores that have an OEM -- excuse me -- 50 percent of the phones that have an OEM store preloaded. So does that mean that this is actually a big competitive force against Google Play?

A. No. That does not follow.

Q. Why not?

A. Well, for several reasons. I mean, the first thing that you have to keep in mind is that there are a lot of -- a lot of smartphones that only have Google Play. I don't know whether it's 50 percent, but it's around a third to 40 percent of Android smartphones only have Google Play and there it's the only default.

And then on the rest of the Android phones, generally there's only one. You know, on each one of these OEMs, there would be one. A very small number there is more than one. So even in those situations, Google is still on a very advantageous position.

But there's more, which is that Google also engages in conduct to essentially discourage these OEMs from competing with Google Play with their stores.

Q. So what conduct are you talking about?

A. Here I'm referring to what's called Premier Tier Revenue

Sharing Agreements, part of what's abbreviated RSA 3.0, and these premier tier agreements actually have exclusivity provisions in them where the OEM is incentivized to classify smartphones -- some of the smartphones or all of the smartphones that they produce as premier tier; and when they do that, they can't preinstall any other -- any other app store on their devices.

Q. Did you look at how many phones and which OEMs devices were affected by these types of premier tier agreements?

A. I did, and we have another slide on this.

So this is leaving out Samsung, and I'm going to come back to Samsung later. So I just wanted to flag that. Samsung is important. They're preinstalled on 40 percent of phones, and I'm going to talk about Samsung in a little bit.

This is all the other OEMs, and I've listed them here from left to right in order of the size of their smartphone shares. So you can see that Xiaomi is the biggest of them. That's the blue bar. The blue bar is their smartphone sales.

And as you go to the right, those shares are getting smaller. All the way on the right there's a category that says "The remaining 830." They're all individually quite small.

Now the other thing that this figure shows are these orange bars, and this is OEM by OEM, the fraction of their devices that are classified as premier tier and that are, therefore, subject to the exclusivity provision. Not all their

phones fall into that category in part because they -- you know, the older phones with lower technical specs don't qualify. But you can see that four specific OEMs, the numbers are quite high.

Q. Can you conclude anything by looking at which OEMs have a lot of devices within the premier tier?

A. Absolutely.

Q. What is that?

A. Well, remember on the previous slide I had grayed out two OEMs for reasons that I explained; and aside from Samsung, there were three left that had significant amounts of preinstallation of their app stores. Those were, and we're showing them again, Xiaomi, Vivo, and Oppo.

Now let's go back to the other slide and see where the RSAs are having an impact. For Xiaomi, Oppo, and Vivo, the orange bars indicate, averaging across them, that it's roughly 60 percent of their phones. So a very large fraction of the phones associated with the OEMs who actually had competing app stores, they had to stop putting those app stores on the phones.

Q. You talked about now ways in which the RSA 3.0 premier tier has affected OEM app stores.

A. Could I just add one item to my previous answer?

Q. Of course.

A. Because I forgot to say it.

These figures apply to new phones rather than the stock of phones. I mean, preinstallations for competition only really matter with respect to new phones. So I have focused here on new phones.

Q. Great. Thank you, Professor.

We've talked about the impact that these RSA 3.0 premier tier provisions have on OEM app stores. Do they have any impact on the third-party app stores, the non-OEM stores?

A. Well, they do.

Q. What is that?

A. I think there's been testimony about the Epic experience with trying to get preinstallation of Epic Games App, EGA, and those efforts ran smack into these restrictions.

Q. All right. Now --

THE COURT: We'll take lunch at 12:15.

MR. BORNSTEIN: Thank you, Your Honor.

BY MR. BORNSTEIN:

Q. You covered this just a little bit with your observation about new phones versus old phones, but there has been some testimony from Google witnesses during the course of the trial so far that the premier tier covers only a very small portion of devices.

Now, what is, in your view, the competitive -- or the significance of that claim for your analysis?

A. Well, first of all, if we're talking about competition

from apps, we have to think about new phones. Of course there's an installed base, and that's going to dilute these numbers. You've got to focus on the new phone -- new smartphone sales, and for those the numbers are much higher.

But then the other thing important to keep in mind is how these RSA restrictions are targeted. Okay? What I'm showing in this figure is that Xiaomi, Oppo, and Vivo, the one with competing game stores -- these aren't potential competitors; these are actual competitors -- they're being hit quite heavily.

Whereas, for example, Transsion, the third largest worldwide smartphone provider according to these numbers, but you saw in the previous table they didn't appear. As far as I know, they don't have a significant app store and they also don't have these restrictions.

Q. So besides direct downloading and preinstallation, any other way for a competing app store to get onto an Android phone?

A. That's pretty much it for all practical purposes.

Q. Okay. So you talked about a third way in which Google has obstructed rivals' ability to compete, which you say is removing opportunities to differentiate themselves.

What do you mean by differentiation here?

A. Right. Well, what I'm talking about here is that in many markets where you have a dominant firm that is benefiting from

its position as the incumbent, it's hard to -- it's hard to make inroads against that.

In the context of Google Play, you've got users going to -- smartphone users going to Google Play because the apps are there, and you've got developers putting their apps on Google Play because users are going there, and it's all kind of reinforcing. And to break into that, you need to offer the consumer a compelling reason to do something else.

And the way that that's typically done in these types of markets is to offer some sort of exclusive content to say "We have some sort of content here that actually you can't get there so you ought to try us." This is a way that companies often successfully break into markets. If they didn't differentiate themselves, they'd just get squashed and they wouldn't be competition.

Q. What has Google done to prevent that kind of differentiation?

A. Here we come to the Project Hug agreements with developers. And the Project Hug agreements have provisions in them that prevent the competing app stores from obtaining or even developing in cooperation with developers exclusive content that they could offer for this purpose.

Q. There's been a lot of testimony about Project Hug in the trial.

One thing that has been asserted, though, that I'd like to

get you to share your opinion on is that there were only about 20 or 22 developers that signed these agreements. Does that affect how competitively significant they were?

A. Well, I mean, an assessment of it has to take that into account, but there are other facts here that I think are extremely relevant and that we need to consider.

In the first place, yes, there are thousands of other developers, but these are very large and important developers. They account for about 20 percent of Google Play revenue. That's just off the top.

But there are a number of other important considerations about them. The issue is that they are strategically important, and I've seen quite a few Google documents that recognize their strategic importance to a potential entrant.

So think about it this way: You want to differentiate yourself. You're an app store and you're entering and you want to differentiate yourself from Google Play. If you have exclusive content to League of Legends, that's a well-known app, lots of people want it, that's splashy, that feels important to users, that will make a difference. If you announce that you have exclusive content to, you know, Veggie Garden Planner, that's not going to make an impression on anyone.

So the thing that's important to execute this strategy well, this entry strategy well, is to be able to develop

exclusive content that will make a difference. And just judging from Google's own documents describing the Project Hug developers, these were the ones that it had identified as potentially being able to make a difference to these entrants, and also they were characterized as the ones that were willing to consider going off Google Play.

Q. So what did you ultimately conclude about the competitive effect of the Project Hug provisions that the jury's heard so much about and that appear on the screen here?

A. Right. These provisions, just to be clear, are parity provisions. They basically say that developers have to release on Google Play at the same time that they release elsewhere, and what they release has to have the same content and features. So this is basically, you know, preventing any significant differentiation.

My conclusion about this is that it has significant anticompetitive effects, and I say that for a couple of reasons. One reason is it blocks the main viable entry strategy into this industry. You need the differentiation to accomplish anything.

The other thing is it discourages app developers and competing app stores from developing new content. If you think about, you know, the position of an app store, you might try and make a deal with one of the app developers to actually develop new content that you could then have -- you could then

offer exclusively through your app store.

But these provisions are saying, "Well, even if you develop it cooperatively, you still have to put it on Google Play." Think of what that does to the incentives of a rival app store.

I mean, you develop something and then your competitor gets the benefit of it too. So it takes away their incentives to do that. It takes away the incentives of the developers to develop the kind of content that would be suitable for these exclusives that they could offer other app stores. So there's a disincentive to create value.

Q. All right. Let's turn to the other category of anticompetitive practice that you describe, which was buying off potential rivals.

A. Yes.

Q. As an economic principle here, why would it make any sense for a monopolist to pay its rivals not to compete?

A. So I have a couple of demonstrative exhibits that I want to talk through that explains how the economics of this works.

In this slide, I'm showing two different scenarios. These are very simplified scenarios, and the numbers here are just all hypothetical, made up, so that I can make the point.

Okay. In the scenario over on the left, we have a dominant firm that is providing some product to consumers without competition; and in that setting, because there's no

competition, the dominant firm gets a very large slice in the value that's created. I've written that as $75. Only 25 is left for consumers.

Now, over on the right I'm showing another scenario. This is a scenario where we have a rival in the market. Two things happen when you have a rival. The first is that the pie grows. The reason the pie grows is that competition helps good things happen. It lowers price. It increases quantity. It spurs innovation. So there's more value being created, so it's a bigger pie.

The other thing that's going on here is now the consumers get a much larger slice, the reason is that the rival firm and the dominant firm are now vying for the consumer's attention.

Okay. Now, let me explain now how paying off a rival works.

Going to the next slide, the scenario on the right is exactly the same as before. I haven't changed it. What I've done is changed the scenario on the left, and what I'm assuming here is that the established firm, the dominant firm, is paying this rival not to compete. So that's that slice. That $20 slice becomes a payment to the rival. The size of the pie is the same as it was on the last slide because the rival isn't competing. You don't have the benefits of competition.

Now, you'll notice that the $20 that goes to the rival on the left is bigger than the 15 that the rival would get on the

right. So what that means is it's better for the rival to decide to play ball with the dominant firm rather than to enter as a competitor. If it plays ball, it gets 20. If it competes, it only gets 15.

Okay. Now, what about the dominant firm? The dominant firm pay has to pay off the rival; but on the left, it's left with 55 and on the right it gets 40. So which is better for the dominant firm? It's clearly better to pay off the rival.

What happens -- okay. So now the dominant firm is better off, has greater profits. The rival has greater profits. Where do those come from? They come from consumers. So compare how consumers do on the left and the right. Consumers are much worse off.

So this is what we worry about in antitrust economics; that firms will find these kinds of ways to suppress competition and hurt consumers as a result.

Q. Now, have you seen conduct that Google has engaged in that you think fits this framework that you've just described?

A. I have, yes.

THE COURT: Okay. We'll leave that, and we'll take our lunch break and we'll be back at 12:45.

THE CLERK: All rise.

(Luncheon recess was taken at 12:13 p.m.)

AFTERNOON SESSION **12:51 p.m.**

(Proceedings were heard in the presence of the jury:)

MR. BORNSTEIN: Thank you, Your Honor.

BY MR. BORNSTEIN:

Q. So, Professor Bernheim, before lunch, you had explained the slide that's currently on the screen about the incentive that a monopolist might have to pay off a rival, and I had asked you whether you had seen any conduct that Google had engaged in that fits this framework.

A. Yes. There are two contexts in which this sort of thing takes place, and I've referred to both of them already. One is the RSA 3.0 revenue sharing agreements with OEMs and the other is the Project Hug agreements with developers.

Q. All right. So as to the RSA 3.0 agreements with OEMs, how do they fit into this framework?

A. So part of premier tier is there's an exclusivity provision that I've discussed, but we can set that aside for a moment.

There are also revenue sharing provisions whereby Google shares a fraction of Google Play revenues with the OEM. And so imagine that you're an OEM and you have a 20 percent revenue share with Google. Think about the effect on your incentives for launching a competing app store. You could by virtue of doing that, by virtue of doing that you could draw business away from Google; but for every dollar that you pull away from

Google, you're losing 20 cents right off the top.

And it's even worse than that. Because if by virtue of entering the market and competing with Google, Google ends up reducing its commissions in response -- its commission rate in response to your competitive entry, you then lose money on everything else that Google sells because your 20 percent is now 20 percent of a smaller number.

So entirely apart from the exclusionary provisions here, these provisions strongly disincentivize rivals from operating competitively with Google Play.

Q. Which OEMs got the most generous revenue sharing terms from Google?

A. Well, according to my understanding based on the documents that my team and I reviewed, this is a list of the premier tier revenue sharing percentages for Google Play revenue, and you can see at the top of the list are Xiaomi, Oppo, and Vivo. These are the OEMs that had competitive preinstalled app stores, setting aside Samsung and setting aside the two that essentially disappeared.

So what we see here is aggressive revenue sharing being given not to potential competitors but to actual competitors.

Q. And OnePlus I see is also on here as a 20 percent rev share. How does OnePlus fit into this list?

A. Well, OnePlus also received this provision. My understanding is OnePlus is affiliated with Oppo. I can't

remember at this point in time whether it was some sort of a partnership or ownership, but there was an affiliation between the two companies.

Q. Excuse me.

You also mentioned the Project Hug agreements with developers. How do they fit into this buying-off-rivals framework?

A. Well, remember, the Project Hug agreements provided generous payments to the developers in exchange for agreeing to these exclusionary provisions. And if you're a developer, think about the position that this is putting you in. Some of these developers -- there is indication in the trial testimony, I think, certainly in the record, that some of the developers considered launching game stores; and had they done that, they would have been actually competing with Google Play.

Instead, they, by virtue of being induced through these incentives to agree to these terms, put themselves in a position where they couldn't even take the material that they developed for their own apps and launch an app store and have any exclusive content for their own apps. So this would have strongly discouraged them from entering.

Q. Well, there's been some testimony that the agreements that were signed by these developers, like Activision and Riot, didn't actually prohibit the developers from opening their own store. What significance does that have to you as an

economist?

A. Well, as an economist, I look at this as a matter of incentives, and I'm asking: What -- how does the agreement affect the developer's incentives to entry -- enter?

If you take away the developers's ability to have exclusive content for its own apps on its own store, you're -- you know, you're cutting the ground out from underneath them.

Q. So we've walked through a number of different types of conduct. As an economist, do you look at all of these one by one or do you look at them together as a collective?

A. Well, I think both. I mean, I look at them one by one; and taking them one by one, I consider them anticompetitive, but it's really important not just to think of them one by one. Here it's the collectivity of this conduct that's really important.

The way to think about this is Google is erecting multiple hurdles that a competitor would have to clear to be a meaningful factor in app distribution, and it could get by one hurdle, it could get by two hurdles. If there's another hurdle and it doesn't clear that one, that takes care of them. So it's important to think about them together.

Q. Did you see any evidence in the record during your review that suggested or supported your view about the importance of reviewing this all as a whole?

A. Yes. I think internal Google documents confirmed that

they thought of it that way.

Q. Have you seen this document before?

And this is in evidence, Your Honor.

A. I have, yes.

Q. Can you tell us whether you drew any inferences from this document about the importance of viewing the conduct as a whole?

A. Well, I view this document as corroborative. It corroborates the explanation that I just gave.

Q. How so?

A. So the title here refers to GDAF. That, as I understand it, is a precursor to the revenue share agreements. So this is -- RSA 3.0 was a follow-on to that.

And you can see that in the title it's describing these Revenue Sharing Agreements as complementing Hug and Banyan. And I haven't talked about Banyan yet, but I know that there's been trial testimony about that, and we'll come to it. So this is acknowledging that these things are complementary.

And then the slide is identifying various threats to Google Play and talking about their risk mitigation strategies, and you see there's a column for developers and a column for OEMs. And in the column for developers, they refer to Hug; and in the column for OEMs, they refer to Banyan and GDAF, which, as I said, is revenue sharing.

And then below that where it describes the mechanism, it

refers to incentives in both cases. And that's exactly what I'm saying, that these provisions, this conduct, disincentivizes the competition.

Q. Let's turn to a different one of your conclusions, which was that Google's conduct allows it to create and maintain monopoly power.

So as part of your work, did you look into the question of whether there are currently any other app stores on Android that have a significant presence?

A. I did.

Q. And what other stores did you look at?

A. Well, I looked at a collection of I think it was a dozen, 12, 13, 14 app stores. These were stores that Google gave us data on.

Q. And what did you find?

A. I have a slide that shows my conclusions here.

You can see again on the bottom axis we have time. This is date. And on the vertical axis it's percents. Those percents represent share of entitlements, and I need to explain what an entitlement is. An entitlement basically refers to a downloaded app. So you can think of it that way. You get, you know, one entitlement, that means that one app was downloaded.

Now, at the bottom you can see that there are all sorts of app stores represented on this figure. Samsung is there, Oppo, Vivo, and Xiaomi is there, and the figure is showing their

individual and collective shares of entitlements, and it's this tiny sliver. It's barely detectable here.

So let's blow it up. Let's zoom in on it. Okay. Now I'm blowing it up so we can actually see it.

Now, the vertical axis, notice that that's changed. Instead of running from 0 to 100 percent, it now runs from 0 to 6 percent. So these are not big shares, but now you can at least see what's going on.

Okay. So Vivo, one of the app stores that's preinstalled, that's the blue at the bottom, they hit about 1 percent. And then Oppo adds maybe another percent to that. Samsung a little bit less. Xiaomi, something in the same order of magnitude. And then there's lots of little things here that don't amount to much at all. So each one of these stores has a slice of like 1 percent at most of downloads. It's very small.

Now let's zoom back out and look at Google Play.

That's what utter dominance looks like. Okay? Google Play's share relative to the other app stores is completely dominant.

Q. You said a couple of times during your testimony that we'd come back to Samsung.

A. Yes.

Q. And we saw the Samsung store was preinstalled on something close to 40 percent of phones on one slide. Doesn't that make it a meaningful competitor?

A. No, it doesn't. That's something that's helpful for competing, but it doesn't mean that Samsung is competing or is competing effectively. And, in fact, Samsung is represented on this diagram at this scale, it's really hard to detect because it has such a small share of the app downloads.

Q. Are there other indications you've seen beyond just the tiny share that Samsung has that it has not been a significant competitor to Google Play?

A. Yes. The other thing that I've looked at that's really quite striking is Samsung's app catalog, and I want to come at this in two different ways. One is to look at the top 20 apps on Android worldwide. I believe this is by downloads. You see each one of these apps listed, and then there's a column for whether it's on the Galaxy Store.

And you can see that the Galaxy Store, at least at this point in time, only had five of the top 20 apps on Android. Now here's what's really peculiar about that. You might think: Well, that's just because Google somehow, you know, has greater reach, they have more.

But other stores also had more. Amazon, the Amazon Appstore, which had an even tinier slice of the downloads on the previous slide, it was hard to make out at all, amazon has 10 of the top 20. So what's going on with Samsung here?

I'll tell you the other statistic. Total number of apps offered on the Samsung App Store, most recent data that I know

about, places it around 200,000, maybe a little less, maybe a little bit more, and that sounds like a lot. Google Play has something like 3 million apps. So very big difference.

But even when we think about other app stores, if we think about the Amazon Appstore, it has more than twice as many titles as Samsung. Aptoide, which is one of those third-party stores with a tiny, tiny slice, it has more than five times as many as Samsung. So something odd is going on here with Samsung.

Q. Did you see anything in the record on your review that gives you an indication of what that might be that was going on here?

A. The record and testimony, as I have read it in any case, indicates that historically Samsung has just not been terribly interested in competing vigorously with Google Play.

Q. Were there instances or times when Samsung got a little bit more robust in its efforts to compete?

A. Yes, there was. In the 2018-2019 time frame, Samsung made a deal with Epic to distribute the Fortnite app on the Samsung Galaxy Store.

And then around the same time, Samsung was looking at developing exclusive conduct with other app developers, which is the entry strategy that I've talked about. And at the same time, the documents indicate that Samsung was considering using more aggressive or lower commission rates; that it was

requiring Galaxy Store to be loaded on the home screen. So they were doing all of these things at that point in time.

Q. Did Google do anything in response to these actions by Samsung?

A. Yeah. Google did a couple of things. The first thing it did was Project Hug. Project Hug, the deals that were struck with the major developers, took them off the table from the point of view of exclusive conduct -- content.

And then the second thing that -- and the impact of that, of course, was the same as before; that limited Samsung's ability to differentiate itself from Play.

And then the second thing that Google did was to launch what was called Project Banyan.

Q. And there's been a lot of testimony about Project Banyan we need not go over again. But did Project Banyan happen? Was it actually signed?

A. No, it wasn't.

Q. So why does it matter?

A. Well, I mean, it matters for two reasons. It gives us a window on Google's strategies because we see this strategy playing out with rivals in a number of contexts.

The other thing is you have to keep in mind that though Banyan didn't happen, further negotiations between Samsung and Google did, and eventually an extremely generous revenue sharing agreement was signed. It didn't prevent Samsung from

preloading its Play Store; but since then Samsung seems to have gone back to the historical pattern of going: Okay. We're really not interested with competing that much with Google in app distribution.

Q. So set aside the factual questions about what Samsung may or may not have been thinking. I want to ask you, as an economist, are there principles that you have seen and written about that would explain Samsung taking that approach here?

A. Sure. The principles, the economic principles, that speak to this issue concern what happens when you have corporations that do many things and have many points of contact with each other. So they have a very interdependent relationship.

So just to take an example, I think Samsung makes a chip for the Google Pixel phone. So there are various ways that these companies interact. They are independent; they are interdependent. And what we know is that in those kind of settings, companies tend to mutually forebear to some degree. Even if they agree not to compete, they find it in their interests individually not to compete too vigorously.

Q. All right. So we've talked about other app stores and their presence. Did you also look at competitive alternatives to Google Play besides app stores?

A. Yes, I did.

Q. All right. And did you look at what the share was of those other alternatives?

A. Sure. Let's go to the next slide.

This slide is data on shares of downloads that include not just app stores but direct downloading and other ways of downloading apps onto Android smartphones.

Again, you can see that the horizontal axis at the bottom is just time, it's just date; and then the vertical axis is showing you percentages or shares, and the green is Google Play's share.

So in the most recent year for which I have data, Google Play's share roughly -- of these entitlements is roughly 83 percent.

Q. And to be clear, what makes up the gray portion at the top of each bar?

A. Well, that's everything else that we can determine in the data. So it would cover the app stores that I talked about. It would cover other app stores that possibly we missed. It would include direct downloading. It would include peer-to-peer file sharing.

Q. And is this ballpark 15-ish percent gray portion at the top of the bar competitively significant in your view?

A. Well, it's not terribly significant competitively, both because the share is small and because it's not one or a couple of significant viable competitors. It's a bunch of very tiny competitors who individually can't stand up to Google Play.

Q. Did you do any analysis to dig in a little further on what

kinds of circumstances explain some portion of those downloads that happen off of Play?

A. Yes. And this is actually important to understand that many of the downloads that occur on alternatives to Google Play are taking place under circumstances that don't really tell us very much about how competitive they are with Google Play, how easily consumers can substitute them.

And I'll just give you some examples. In Iran, which is included in those shares that I was showing you a minute ago, in Iran, Google Play is periodically banned; and if you can't use Google Play, well, okay, then you use something else. It doesn't mean it's a good substitute; it just means there isn't an alternative. So you see the figure in Iran, actually close to 80 percent of it is not Google Play. That's in the previous slide.

Okay. What about India? Well, some special things happen in India too. One of the things that happens is people buy their phones at shops, and the shopkeeper will some of the time install something in the shop and then hand it to the consumer. That is a -- it's not something that the consumer did or potentially even knows about, but it is counted in these figures.

Another thing that happens, which is also relevant in India, is when you get into areas where access to the Internet is intermittent, well, then you can't really use Google Play

all the time, and that's where peer-to-peer file sharing comes into play.

So in the countries where there are those circumstances, you do see more of these off Google Play downloads. Much less in the United States. The Google Play share here for the U.S. is 95 percent.

Q. So going back to this prior slide here, do you know -- set aside percentages, do you know about how many downloads each month this gray non-Google Play portion represents?

A. Yes. It's a huge number. It's like 3 billion downloads per month. So a large number.

Q. That's a huge number. Doesn't that mean that these are good alternatives to or substitutes for Google Play?

A. No. You have to think about the scale of the market. This is the globe. This is the world. Okay? 3 billion is a big number. A bigger number is 15 billion. That's about what Google Play has.

And when economists look at competitive impact, they don't look at the absolute numbers. They look at shares. They ask: How big is the share? The share is speaking to competitive significance. The share for Google Play here is dominant. It's overwhelming.

Q. Well, does 80 or 85 percent as shown here, does that ordinarily indicate monopoly power to an economist?

A. If it is a share of the market, yes, that would usually

indicate that.

Just to take an example, let's say you had a market where one firm had 50 percent of the market. Not 80. 50 percent of the market. Under the criteria that economists use to evaluate concentration, criteria that are endorsed and used regularly by the Federal Trade Commission, the Department of Justice when they enforce competition policy, if one firm has 50 percent of the market, under this criteria, that market is classified as highly concentrated, which means that there's a considerable concern that there is meaningful monopoly power.

This isn't 50 percent. This is over 80 percent. So this is extreme.

Q. All right. You were very careful in answering the question I just asked you to say if this were a market, it might indicate monopoly power. Can you explain why you gave that careful clarification?

A. Yes. Well, we haven't reached the conclusion yet that app distribution on Android smartphones is properly -- is a properly defined antitrust market. To do that, we have to ask: Are there other substitutes that customers might use? Not just these forms of app distribution but something else.

Q. All right. And we spent some time before the lunch break talking about substitutes and how you think about them, but let me ask one more question along those lines.

In defining a product market, does an economist look at

every possible substitute that a buyer might turn to?

A. No. No, we don't. The criterion is whether they are close substitutes, reasonable substitutes. The substitution has to be close enough for the product to provide meaningful competitive discipline.

So let me give you an example of that. Let's say that you're buying a television and you might buy a Samsung television. Well, you could have bought an LG television. You could have bought a Panasonic. Those are good substitutes. Okay? Those would be in the product market. They would discipline Samsung's price of televisions.

Let's say that you're buying this TV because you like to watch movies. All right. Well, another way to watch movies is to go to movie theaters. That's a substitute at some level.

But we have to ask ourselves the question: Is that a close enough substitute such that the movie theater operators are providing meaningful competitive discipline for the television manufacturers? And in that example, that's kind of farfetched; right?

So it's not enough that it's a substitute. It has to be a close substitute.

Q. Did you look for and analyze what constitutes sufficiently close substitutes to Android app distribution services like Google Play?

A. Yes, I did.

Q. All right. And which potential substitutes did you look at?

A. Well, we have another slide.

And you can see that there are three alternates listed under the first bullet point. The first is app distribution on iPhones. The second is app distribution on other kinds of devices. So game consoles, for example, would be an alternative. And then the final possibility is web apps.

Q. And you've divided this slide between consumers and developers. Why did you look at both?

A. Well, remember that the app distribution transaction has a seller, like an app store, and two buyers. You've got a developer and a user that the store's basically putting together to satisfy their shared need. So you have to think about both.

Q. All right. So I want to dive into each of these; and given the trial testimony, I really want to focus on and spend more time on iPhones and Apple than the other subject matter.

So what did you conclude about whether or not app distribution on iPhones is a close enough substitute to be in the same market as the Google Play Store?

A. Well, I concluded that it isn't. And to be clear, this is a different conclusion. I'm not saying that Apple and Android don't compete. What I'm saying is that Apple is not in the market that I am defining, which is about app distribution.

Not about smartphones. It's about app distribution.

Q. Well, let's look at the map of markets again. Can you explain where you're focusing and where Apple fits again?

A. Right. So, again, to just remind you, the focus here is on the markets that are in this kind of red circly object thing that I have here, which is the market containing Android app distribution services. That's what we're focusing on.

Apple, as I explained before, they're here (indicating). Okay? They're important. We have to think about them, but they're not competing to satisfy those consumers -- pardon me -- in those transactions. What they're doing is competing to satisfy consumers in transactions that involve buying smartphones.

Q. So how would you determine whether or not Apple and the app store imposed a sufficient constraint on the Google Play Store?

A. So here I use a device that economists often deploy to think about these issues, which is to think about the effects of what's called -- this is a technical term that gets abbreviated -- a small but significant nontransitory increase in price, and that's abbreviated SSNIP. So when I say a SSNIP, that's what I'm referring to.

It is usually when they say a small but significant, the standard is usually a 5 percent price increase. Some of the time 10 percent is used, but 5 percent more commonly.

And basically what we're asking is: How much substitution would there be in response to a 5 percent change in price?

Q. And you refer to substitution here. Are you talking about people moving from using the Google Play Store to using the Apple App Store, or do you mean something else?

A. Well, yes, but indirectly. So this would have to be someone saying, "Okay. I want to switch from the Google Play Store to the Apple App Store. I need to get rid of my Android phone and get an Apple phone so that I can use the Apple App Store."

So it's indirect. The ability to substitute is very indirect. You can't use the Apple App Store on the Android store, so you have to change phones.

Q. All right. So did you do any analysis to see how big a SSNIP or a price increase here of the type you described would be?

A. Yes. Well, one way to gauge it is to think about: Okay. What are the fees that Google Play collects for app distribution over the life of the typical user's phone? And we have those statistics from Google. That's about $10.82.

Okay. Now, if Google Play were to increase those prices by 5 percent, that number would go up -- increase the fees that it's charging by 5 percent, that number, that $10.82, which is the average, would go up by 5 percent, which is about 52 cents over the life of a phone.

Now, I want to be clear that's an average. All right? Some people use Google Play a lot more than others and generate more revenue than others; but even if it's five times that big, somebody who spends five times more than the average, that's only $2.50 or 2.60. Someone who has 10 times as many purchases on Google Play, that's only a little over $5.

And to put those numbers in perspective, you know, the price of a typical phone where someone would be considering switching to an iPhone, the comparable Android phones are like $700. Okay? So we're talking about not a lot of money in comparison to that.

Moreover, someone who's when they're buying the phone thinking about the costs of the apps they're going to buy presumably would be thinking about the rest of the operating costs too, and over the life of a phone, that's going to be thousands of dollars in total because you have to have, you know, your cell phone plan and all that sort of thing.

So when we talk about these kinds of changes and what consumers would be spending on Google Play in response to a SSNIP, a small price increase, it's just really tiny compared to what they're spending on their phones.

Q. And so what does that tell you about the substitution patterns here?

A. Well, you have to consider substitution patterns in the context of a given price increase. And what it's saying is

that in the context of this price increase, this is just hard to believe it's material for many people.

Now, to be totally clear, if we were talking about smartphone markets, if we were focused on the part of this slide where Apple and Android OEMs are vying for the attention of Android smartphone users, selling phones to them, if we were focused on that, then in considering a SSNIP, we would be focused on the price of a phone, not on the price of app distribution services.

So the phone is $700 and you do a 5 percent SSNIP on that, that's $35. It's a lot bigger. So it's entirely possible that consumers would substitute in the smartphone markets in response to such differences, but it's hard to believe that they would substitute much in response to the differences that I'm describing that would come from the app distribution market.

Q. All right. Well, let's set the numbers aside.

Did you do anything else to assess whether competition between Android and iOS smartphones constrains Google's power over app distribution?

A. I did, yes. And I have another slide that summarizes the things that I looked at.

Q. All right. Well, let's -- we'll go through these. Let's focus on the first reason here, which is limited substitution in the smartphone market. Can you explain why that is?

A. Right. So now I'm actually focused on that smartphone market that was in the lower right on the -- and I should have said "markets" plural -- that was in the lower right of the previous figure.

There are a couple of things that I examined here. One is switching costs between platforms. The other is these platforms are actually targeting different customer segments which limits substitution between them.

Q. All right. So let's talk about those. What do you mean by switching costs?

A. Switching costs are costs and inconvenience that a smartphone user incurs when they switch from one platform to another. So that would include things -- I think there's been testimony about it -- things like learning a new operating system, incompatibility with your other devices, things like that. Those are, whether they're monetary or not, they're real costs, inconvenience, time. A lot of people just don't want to go through that.

Q. And what did you find about the magnitude of the switching costs here?

A. Well, there are some estimates on the magnitude of switching costs between these platforms in the academic literature. They're older estimates now. They come from data that was between 2011 and 2014. At that point in time the switching costs were measured as being equivalent to literally

many hundreds of dollars.

Now, since then things have changed. In some way switching has gotten easier, but what's interesting is that rates of switching from Android to Apple have not gone up. In fact, they've gone down -- okay? -- which is not consistent with this process having gotten -- maybe it's gotten easier in some respects, but there are still barriers and the barriers are actually reducing switching even more.

Q. Why do these switching costs matter to your analysis?

A. Well, these switching costs speak to the degree of substitution between Apple phones and Android phones. And I want to underscore I'm saying "degree." I am not denying that there is substitution between Android phones and Apple phones or that they see each other as competitors in smartphone markets. All of that I think is true.

The issue is: Is there enough substitution that gets fed into the app distribution market? And it's -- again, this is limited substitution in the smartphone market is going to be further attenuated when you start thinking about app distribution.

Q. All right. And you also mentioned that iOS and Android target different customer segments. What do you mean by that?

A. Well, oftentimes in markets there are different segments. I mean, it's familiar to have budget brands of certain things and then luxury brands of those things, and Apple and Android

have really specialized in different parts of this market.

So this figure is showing the distribution of smartphone prices separately for iOS, Apple iPhones, and for Android. And Android is in green. iOS is in blue.

Along that bottom axis, all those categories, those are price bins. Okay. So you'll see right in the middle there's a bin 700 to $799, and there's a blue bar there and that blue bar tells us that about 10 percent of Apple phones fall into this category.

Now, these phones, by the way, it says at the top here I'm just looking at phones with four or more gigabytes of RAM. If I included all phones, what I'm about to tell you would be even more striking.

What you see here is that there basically are no Apple phones at most of the Android phone price points. The Android phones tend to be sold at prices that are over to the left. Okay? And then as you go to the right, to the higher prices, Apple starts appearing.

So about overall, the figure is that about I think it's 83 percent, 85 percent, something like that, of Android phones worldwide are less expensive than the cheapest iPhone.

Q. And so --

A. I'm sorry.

The one other thing I wanted to point out about this is that at the higher end of the price distribution, there are

actual Android phones at the iPhone price points. There are fewer of them, but they are actually there; and to the extent there's a lot of substitution, well, that's where you would expect it to occur.

Q. So what is the relevance of this segmentation between Android and iOS for your product market definition?

A. What sometimes happens in markets where you have very small numbers of firms -- and, you know, here in this industry we've got two making, you know, two systems. We've got the Android phones and then we've got -- you know, we're thinking about Android phones versus the iPhones. That what sometimes happens in those markets is the firms realize that it's in their mutual interests to go after different market segments. And this, at least, is consistent with that.

Q. Well, could it -- here's an alternative: Could it be the case that Android by lowering its prices in this way is just competing really hard against Apple?

A. Yeah, I think it's pretty clear that that's not what's going on, and I have another slide that gets at that.

So look at the slide over on the left. And, again, on the bottom is time, that's date. And here on the vertical axis we're measuring smartphone prices. Let's just start with the green line. Not the dashed ones. The solid green line.

The solid green line is the average price of an Android phone over time, and you can see that it's been going down over

time. What those dashed lines represent, that's the middle 50 percent range for their phones.

Okay. Now compare that to what's gone on with Apple iPhones. Exactly the opposite pattern. Their average prices have been rising. That's the blue line. Okay? And, again, the dashed lines mean exactly the same thing.

If Google was just competing aggressively in price, if that's what we were observing here, competition of that form, Apple's prices would be competed down. It would be following Google. That's not what we've got. We've got them bifurcating. We got them going in different directions.

And over on the right-hand side, what I've plotted there is the difference in the average price of Apple phones and Android phones. You can see that that's been steadily increasing over time.

So what all of this tells me is, yes, there is some substitution between these phones, yes, there is competition, but it's very blunted by the fact that they are, to a large extent, going after different market segments.

Q. All right. Well, let's turn to your second set of reasons relating to whether iOS constrains the Google Play Store.

The first reason here, price of app distribution is much smaller than the price of the phone, I think you've largely covered this. But, briefly, what's the issue here?

A. I have covered that. That's the size of the SSNIP. And

if you were talking about smartphones, it would be 5 percent of a much bigger number. So the SSNIP would be bigger. You'd be considering more substitution for app distribution. It's 5 percent of a small number, so there isn't going to be a lot of substitution.

Q. So the second bullet here, what do you mean when you say that people pay little attention to app distribution prices when they buy a phone?

A. Right. So this is another principle that comes from behavioral economics. When people buy durable goods -- a phone is a durable good. You have it for, you know, a long period of time. You just don't buy it and consume it right away. You know, cars, refrigerators, these are all durable goods.

What we know is that when people buy durable goods, they don't pay a lot of attention to the operating costs of those goods. They pay some but they, to some significant extent, ignore those costs when making those purchases; and that further attenuates any effect of, you know, the -- a change in the price of app distribution services on the choice of a phone.

This is actually supported in this context by consumer surveys that indicate which phone features are important to them when they buy their phone. And on the surveys that I've seen, Play Stores often don't appear at all. If they appear, they're quite far down. So this isn't front of mind when

people are making these decisions about which phone to buy.

Q. And why does it matter -- turning to your third bullet, why does it matter that people buy phones infrequently?

A. Right. So by infrequently I mean on average once every 2.7 years. Remember, any switching that takes place between Google Play Store and the Android App Store can only occur if somebody switches their phone, and that's when they buy a new phone. It only happens once every 2.7 years.

And what that means is, if Google raises its Play prices today, the average consumer isn't going to do something about it at all for something like 17 or 18 months.

Q. And how does that affect your ultimate conclusion here about switching?

A. Well, it means that substitution is that much more attenuated going from the smartphone market to the app distribution market, which means it's that much less likely that substitution in response to a SSNIP and app distribution would have a meaningful affect on the division between Google Play and Android -- and Apple App Store.

Q. So looking at all of this quantitative and qualitative evidence that you've described, what was your ultimate conclusion about the extent to which Apple constrains Google's behavior with respect to the Google Play Store?

A. Again, I want to underscore that we are talking about the Google Play Store. We are talking about app distribution. I'm

not talking here about smartphone markets. It's a critical distinction.

Basically here we're balancing the factors that I just described. You know, this is what affects the balance of which phone you buy? Well, on the one side, you've got this small increase in the price of Android app distribution, which, as I said, on average, life of the phone, 52 cents, something like that, users who use it 10 times as much as the average, it's, you know, $5, a little over $5.

On the other side, you've got all the other factors that I've just listed. And I don't think that it's plausible that substitution in response to a SSNIP is significant in light of these considerations.

Q. All right. A couple other things on Apple.

Number one, did you look at actual switching rates between Android phones and iPhones?

A. I did, yes.

Q. And what did you conclude based on that review?

A. Well, the switching rates -- I mean, there's a range of switching rates. One figure that I've seen is that when people buy a new phone, they switch from Android to iPhones about 12 percent of the time.

Now, to put that into perspective, that's happening on average once out of every 2.7 years, which means that in any given year, only about 3 or 4 percent are switching.

So now think again in terms of app distribution. You're increasing the price of app distribution; and, you know, over the next year, there just aren't a lot of people who are going to be switching.

Q. Second question. There's been some testimony at trial about Google employees looking at what Apple does in its business and paying attention to that. Doesn't that show a competitive constraint that Apple is imposing?

A. No. You can't reach that conclusion from that kind of evidence.

Q. Why not?

A. Well, there's a practice that goes on all the time in businesses. It's called benchmarking. Benchmarking is a matter of looking around at other firms who are doing something similar in order to get good ideas: Find out what's working. Find out what isn't working. We learn from observing what others are doing, and that goes on even when firms don't compete.

A good example would be, imagine that there are two regional airlines that have nonoverlapping routes, so they don't compete with each other. Maybe one flies on the West Coast. The other flies on the East Coast. They may still look at each other. They may still look at each other's business models and see what are they doing to attract customers and so forth. They may get great ideas from that, and they may find

other things don't work by looking at what others are doing.

So benchmarking isn't just a matter of looking at your competitors. It's a matter of looking at a range of firms who kind of do things that are similar. So you can't draw conclusions about substitution from that.

Q. Are there any other aspects of the complicated Google-Apple relationship that you looked at in considering the extent of the constraint that Apple may impose?

A. This is related to a point I raised about Samsung earlier. There are many points of contact between Apple and Google. You know, Google apps are on Apple phones and so forth. And, again, when you have large companies with many points of contact, there tends to be some degree of mutual forbearance for the reasons that I've described previously.

Q. All right. So that's Apple.

There were two other potential substitutes you looked at. I suggest you move through these much more quickly.

The first one you mentioned is other nonsmartphone devices. What types of devices are you talking about here?

A. Well, these are things like game consoles, personal computers, things like that.

Q. What did you find about whether these are sufficiently close substitutes to be in the same market as Google Play?

A. I do not find evidence that they're good substitutes for app distribution.

Q. And at a high level, why is that?
A. Well, I mean, think of it this way: These devices have very different functionalities and because of their different functionalities, they're used for different purposes and, you know, for -- and in different ways.
If you are commuting to work on a bus and you want to play Fortnite, you can pull out your iPhone. You can't pull out your game console. Once you get home, you may really prefer to play on the game console rather than on your phone because you've got -- I think I said "iPhone" when I meant to say "smartphone" -- because you've got a big screen and you think that that's a lot better.
So the different functionalities make them, you know, not very good substitutes.
Q. Are there the same types of apps available on the different devices?
A. To a large extent not. We have a slide up now that summarizes this.
This is looking at the top 150 apps on Android, and I've noted here that of those, about two-thirds were available on Windows. And when we look at the leading game consoles, they -- well, they just have games, so it's a very, very small fraction of what's available on Google Play.
Q. And why does that matter for switching?
A. Well, it means that you simply can't switch for a lot of

these apps.

Q. Did you look at any quantitative analyses about substitution to other devices besides smartphones?

A. I did.

Q. What was that?

A. I did an analysis of what happened when Fortnite was removed from Google Play. That's an event I think there was testimony about at trial.

So I looked at that event; and in interpreting that event, it's important to remember that Google -- not Google -- Epic has designed Fortnite as a multiplatform game. So if you're going to find substitution anywhere, you ought to find a lot of it here.

Okay. So what I did was look at what happened with usage of Fortnite on Android and other platforms before and after Fortnite was removed from Google Play, and I found two things.

One is that when it was removed from Google Play, usage on Android fell quite significantly. And, you know, that indicates people aren't just substituting to other modes of distribution on Android.

But the other thing that I found was usage on other platforms didn't go up detectably at all. There's no indication of substitution of usage to other platforms.

Q. And you keep saying "usage." What metric or, you know, measure did you use to assess usage?

A. This was minutes spent on the games.

Q. Did you look at any other possible ways of measuring usage?

A. Well, I think that for the purpose of app distribution, this is the right measure because you can't use an app on a smartphone unless you use the distribution services on the smartphone. So usage is really the right measure, but I've also looked at data on revenues generated.

Q. Okay. Which showed what?

A. Well, the general pattern with revenues is that people pay where they play. So, you know, somebody has a lot of their usage on a particular device, then proportionately they have, you know, comparable share of their spending on that device.

Q. All right. Let's look at the last potential substitute you addressed, which was web apps. First of all, what does that mean?

A. Web app is an app that you can use directly on the web. You go to a developer's site and you can just use it there.

Q. And what did you find about whether or not web apps were a sufficiently close substitute to Google Play?

A. There's -- there aren't good indications that web apps substitute very well with apps on Google Play for a bunch of reasons.

One is that they have different functionalities. Web apps are limited in many respects. They can't access the

functionalities of the phone. They can't use the phone's camera, for example. They can't use the geolocation services. And the processing speeds also differ because, you know, for a phone, you actually have your computing power right there on your phone.

Also, you can do a lot on native apps, which are the apps on your phone. You can do a lot with them even without access to the Internet. With web apps, you don't really have a choice.

Q. And did you see any evidence of differences in how users interact with web apps versus native apps?

A. Yes, I did. I think I have a slide.

These data reflect shares of total minutes on native apps and web apps for a number of app categories. And you can see that -- just take games, for example. It's the second one. For games, native apps, apps on smartphones, comprise about 99 and a half percent of the total. The web apps are just not meaningful in terms of competitive presence.

And you can see that that's the case for most of these app categories. You have to get all the way down to the last three here -- retail, news, and Internet search -- before you start seeing a meaningful presence for web apps.

Q. So if web apps aren't substitutes, what are they?

A. Well, there's some indication that they're complements, which is the absence -- the opposite of a substitute.

Complements means that they go together as opposed to, you know, substitute for each other.

So here what I'm referring to is, for example, for many developers, if you go to their website and use their web app, you'll see something that says something like "Your experience would be better on our app. Download our app." So in some ways the web apps provide gateways to the native apps.

And you see that in the time usage data too. So in the data that I've looked at, what it shows is that for many apps, the web app users are not using it for very many minutes; that the usage is far more intensive for the native app users in terms of numbers of minutes, which is consistent with the idea that you may try out an app that's available on the web, decide that you like it, and move over to the native app.

Q. All right. Let's look at your last piece here where you said you assessed whether developers have close substitutes. And on developers, let's just limit it to Apple.

Did you -- what did you conclude about whether developers consider developing their apps for iOS as a substitute for developing for Android?

A. Right. So here what you have to think about is the economics of developer substitution. What would make a developer substitute? And the main point here is, if there isn't a lot of user substitution, then there isn't going to be a lot of developer substitution either because the developers

are developing for the users.

Let me give you an example of this. Let's say that there's a grocery chain and they are thinking about possibly building a grocery store, a supermarket, in San Francisco and possibly building one in Los Angeles. Okay?

Now, the question that we would ask when we think about substitutability is whether building the grocery store in San Francisco reduces the profitability of building the grocery store in Los Angeles. If they're substitutes, that's what would have to be going on.

But people aren't driving from San Francisco to Los Angeles to go to a different grocery store. It's very different than if the supermarket chain decided to build the supermarket in San Francisco and another one a mile away. In that case you'd get the same people driving to both stores. Building one of those would reduce the profitability of building the other one.

That's what substitutability is about. It's two ways of addressing the same need or desire, two ways of addressing the same objective.

Q. So how does that apply in the context of Apple and Google?

A. Well, if there isn't a lot of user substitution, then, you know, the analogy is that Apple users are like grocery store customers in Los Angeles and Android users are like grocery store customers in San Francisco.

Developing for one platform does not reduce the profitability of developing for the other platform. In fact, it probably goes the other way around. The reason is that a lot of apps, the value of using them increases as more people use them. So social networking apps, for example. So that would mean that if you did one of these things, doing the other would be more profitable, not less.

Q. Have you seen evidence in actual developer behavior that supports your analysis here?

A. I have, yes. And I think --

Q. What do you have in mind?

A. I have a slide.

This is looking at the top hundred apps on Google Play and the top hundred apps on the Apple App Store, and I'm breaking it down two ways, the top ones by developer revenue and by downloads.

And you can see that virtually all of the top apps on one platform are also available on the other platform. So they're developing for both.

Q. So the jury has heard some evidence and testimony that developers are wooed by Apple and Google differently, but differently that Apple and Google compete for developer attention. Does that show that these are actually substitutes from a developer's perspective?

A. Not to any great extent. What it shows is that Google is

very conscious about lagging behind Apple in terms of releasing titles. That doesn't mean that if Google was able to accelerate the development of apps for Google, the developers would then stop developing them for iOS, for Apple, and that's what would have to happen if there was substitutability. What I haven't seen is evidence that that substitutability is consequential.

Q. All right. So looking at all of the evidence we've just talked about, what did you conclude was the right product market in which to analyze the Google Play Store?

A. As I summarized at the start of my testimony, the right market is app distribution on Android smartphones.

Q. And much as we might want to be at the end of market definition, was there anything else you needed to do to define a market here?

A. Yes. There's one more step, which is that when economists define markets, they also define their geographic boundaries.

Q. What does that mean?

A. Well, it means, you know, where does this market take place? Is it within a city? Is it a state? Is it a country? Is it the world?

Q. And what did you conclude here?

A. Well, I think that the best way to define the geographic market in this matter is global, excluding China.

Q. And why is that?

A. Well, there are two main considerations that come into play. The first is that to the extent the data have given us a window on what happens in different countries, it's largely similar. Competitive conditions are largely similar.

So to take an extreme case, if you had a situation in which competitive conditions were identical in every country, if they were just carbon copies of each other, there would be no point in treating them separately.

Okay. And then the other factor that plays into this is that the conduct cuts across countries. The conduct is global, excluding China.

To the extent the conduct is global, a remedy has to be global as well. So normally in these kinds of situations, economists tend to group similar markets together. They wouldn't group dissimilar things together; but if they're sufficiently similar, we take that shortcut and put them together.

Q. And why do you keep carving out China?

A. China is not similar. China is very dissimilar. Android, Google Android, is not in China. Google Play is not in China. The conduct is not in China. So this just would not be something that you would naturally group with the other countries.

Q. Did you consider any other markets besides this worldwide minus China market?

A. I did. I considered the possibility of excluding some additional countries. We know that there are some others with other kinds of -- where competitive conditions are not exactly the same, like Iran. Collectively they're not that important, and by including them I exaggerate the importance of off Google Play distribution because those are the ones where Google Play isn't dominant.

I also considered a U.S.-only market, just the United States, and I did that because this is U.S. court and, you know, the primary interest may be in the United States.

Q. And did that change any of your conclusions if you used the United States only market?

A. No, it didn't. I reached the same conclusions.

Q. So let's get back to your third conclusion, that Google's conduct allows it to create and maintain monopoly power. Now we've defined a market.

A. Yes.

Q. How do you conclude or assess whether or not Google has monopoly power in that market?

A. Well, in several ways. The first thing that we look at is shares, and this is the same diagram that I showed you earlier except earlier I was careful to say I'm not calling this a market yet because I hadn't considered these other possibilities.

So these are downloads worldwide, Android versus other

download options. It's share of app entitlements, as I explained earlier, and they're showing that Google has this very high share that would ordinarily be considered extremely dominant.

Q. What else did you look at besides market share?

A. I also looked at barriers to entry as I did before, as well as app distribution fees and profitability.

Q. All right. We talked about barriers to entry. What did you conclude or assess with respect to app distribution fees?

A. So this figure shows app distribution fees collected from app transactions on Google Play app distribution transactions. It's the fees that Google collects by virtue of facilitating the downloading of those apps on a per-download basis.

And this is the right way to think about what they're charging because it's basically what they're doing is facilitating the downloading of the app, and the question is: How much money are they getting in exchange for that? They're getting that through a bunch of different fees; but when you add them up, in 2015, it was 15 cents per download. In 2021, it was more than five times that amount.

Q. And what does that tell you as part of your analysis of monopoly power?

A. Well, this is showing one index of monopoly power. The fees that they're collecting, which is the right way to think about the economic price of app distribution services, those

have been going up dramatically.

Q. There's been some discussion about the way that Google's 30 percent -- percentage rate compares to the percentage rate that is charged on other platforms. Do you need to take account of doing that in doing this assessment too?

A. No. That's really an apples-to-oranges comparison.

Q. Why?

A. Well, in fact, I'd say it's pretty much the same as comparing the price of apples to the price of oranges.

The point here is that the economics of different platforms is very different. The same commission rate leads to a very different profitability structure depending on the platform. I have looked at some of the financials for game console companies, and with their commission rate, their profit margins are much, much lower.

Q. Speaking of profits, you said you looked at Google's profits. What did you find there and why is that relevant to market power, monopoly power?

A. Well, the other way we try and gauge monopoly power is by looking at profits, and here I'm showing the data on profits that Google uses internally from their accounting data. The bars show revenues from Google Play. The orange and red lines are profit margins. Operating profit margin is shown in red. And you can see that it's been rising steadily over time. It's now about 70 percent.

Q. In assessing monopoly power, why does that matter?

A. Well, as I described earlier, monopoly power reflects substantial market power, which is the ability to set price substantially in excess of costs, which generates profits. And so here we're measuring profits.

Now, we're not quite there because I haven't addressed investments explicitly, but I've done the calculations to account for, you know, what Google is investing in this platform. And, you know, my calculations show that they've come out many billions of dollars ahead and have earned a rate of return on these investments that's a high multiple of what's called their cost of capital, and anything over their cost of capital is gravy for them.

Q. We -- in addition to the investments, we heard some debate this morning between economists -- excuse me -- between accountants about how to take account of costs. Did you do any independent assessment of that issue?

A. I did, yes.

Q. And does that alter these profit calculations here in any way?

A. Well, I don't think it should. I don't think that -- I disagree with Professor Skinner about -- and I want to be clear about this -- I disagree with him about the economics of what we're trying to measure.

So when an economist measures profits for the purpose of

evaluating market power, we're interested in very specific things; and the principle that governs my calculation here, I'm going to try and explain it. The issue is whether a particular activity is incremental or not.

Another way to explain it is to say that, look, Google could do -- Google Android without doing Google Play. That's entirely feasible. They can't do Google Play without doing Google Android. And what that means is that Google Play is incremental; and, consequently, what we should be looking at is the incremental costs and the incremental revenues associated with Google Play. That's the right economic principle for assessing profits. That's what I applied.

But I also did calculations -- sorry -- to address Professor Skinner's concern. You know, I don't agree with his concern, but I also made adjustments to determine what the answer -- what the numbers would show if we took the issues that he was raising into account.

One thing that I did was allocate these joint and common costs in proportion to revenues, which is a reasonable way to do things. When you do that, you still find that Google is -- has made from Google Play many billions of dollars, and its rate of return on these investments that it's made in Google Play have still been I think something like four or five times its cost of capital. It's still indicative of profits.

You would have to allocate 75 percent of these joint and

common costs to Google Play to get Google Play's internal rate of return on its investments down to its cost of capital, and that just isn't plausible.

Q. All right. So we're in the home stretch, Professor.

Your last conclusion, that Google's conduct harmed users and developers. Can you explain what you found here?

A. Yes. And I think we will move through this one quickly.

Can we go to the next slide?

So here I've made several points. The first is that Google Play's -- Google's conduct harms users and developers by causing app distribution fees to be higher for developers.

Q. How does that happen?

A. This is just a matter of the mechanics of competition. When rivals enter, they frequently enter with lower prices. Consumers benefit directly from that. The incumbent in the market typically responds by lowering their prices. Customers benefit from that as well.

Q. So just to put a number on the kind of fees we're talking about here, what would the impact be of even a 1 percent reduction in Google's commission rate?

A. That's an easy calculation to make. We know that Google makes about $12 billion a year from its Google Play revenue, and their average effective commission rate is a little over 26 percent.

So if we divide 12 billion by 26, we're getting the amount

per percentage point in their commission rate, and that's about $460 million per percentage point; going from 25 to 26 percent, for example.

Q. And those data are from 2021; is that right?

A. I think that's right.

Q. And have the numbers gone up or down since then?

A. I don't recall seeing the more recent numbers.

Q. Okay. Let's go to your second point on higher effective cost of apps for users. How does that happen?

A. Users often benefit from competition -- users would probably benefit from competition as well. You know, you -- competition is giving customers a better deal, and the typical pattern in most markets is benefits are distributed across customers. Some may benefit more than others, but the gains tend to be shared.

Q. Okay. And then you mentioned reduced variety and innovation. What's going on there?

A. Well, this is referring to the fact that app -- that competing app stores would, if they were more viable, be introducing new innovations into app distribution. There are examples of that in the record. One store in Korea, for example, introducing new forms of payment.

I'm not saying here, by the way, that Google doesn't innovate. It does. It innovates a lot. But if there were competition, there would be additional sources of innovation

and additional pressure on Google to innovate.

Q. All right. And the last point, reduced output and innovation in apps on Android. Can you explain what you saw there?

A. Well, one thing that comes up from academic research is that when the costs of development are higher, app developers do less development. And so if they're doing less development because the commission rates are higher, that means that products are not -- you know, products are not being developed, consumers are losing out.

Q. All right. We have reached the end, Professor. Could you just quickly summarize for everyone the conclusions that you reached?

A. Just to review, the first thing that I demonstrated is that Google possesses monopoly power in an antitrust product market for third-party operating systems for smartphones. That's the core of its power.

The second is that Google has used that power to deploy a collection of practices that I've concluded are anticompetitive because they stifle competition with the Google Play app store. Rivals have been impaired directly; other rivals in a sense have been paid off not to compete.

The third conclusion is that Google's conduct, the conduct that I just described, allows it to create and maintain monopoly power in the market for app distribution on Android

smartphones.

And then, of course, the final conclusion is that users and developers have suffered as a result.

Q. All right. Thank you very much, Professor.

MR. BORNSTEIN: Your Honor, I pass the witness.

THE COURT: Okay. Let's take our afternoon break, and we'll come back at 2:25.

THE CLERK: All rise.

(Recess taken at 2:07 p.m.)

(Proceedings resumed at 2:27 p.m.)

(Proceedings were heard in the presence of the jury:)

MR. RAPHAEL: May I proceed?

For the court reporter's benefit, it's Justin Raphael for Google.

CROSS-EXAMINATION

BY MR. RAPHAEL:

Q. Good afternoon, Dr. Bernheim.

A. Good afternoon.

Q. You talked about focusing on app distribution as opposed to the purchase of smartphones. Do you recall that?

A. Yes.

Q. So I noticed on your slides you referred to what you called the Android ecosystem. Do I have that right?

A. Yes.

Q. And in an ecosystem, Dr. Bernheim, everything in the

system is connected and has to work together; right?

A. I'm not sure I'd say it that way, but approximately.

Q. And when users purchase a smartphone today, their device is either part of the Android ecosystem or the Apple ecosystem; right?

A. Yes.

Q. And a smartphone ecosystem includes an operating system, apps, and devices; right?

A. Yes.

Q. And when users buy a smartphone, they aren't just buying a device, are they?

A. No.

Q. When users buy a smartphone, they're also choosing an operating system and a set of apps for that system; right?

A. Well, they're not choosing the apps when they buy the phone. They're choosing the set of apps that are available on that platform.

Q. Right. And apps are essential components of smartphones; right?

A. Yes.

Q. And apps are an essential part of a smartphone ecosystem; right?

A. Yes.

Q. And so attracting app developers is critical to the success of a mobile operating system; right?

A. Yes.

Q. And the quality and variety of apps is an important factor for what devices users buy, isn't it?

A. It is a factor. As I said in my direct testimony, there are consumer surveys that indicate that it's not --

Q. Well, I'm asking for your opinion, Dr. Bernheim.

And it's true, isn't it, that the quality and variety of apps is an important factor for what devices users buy, isn't it?

A. It's important on some level. What I was referring to is relative importance.

Q. Now, the value of an app store depends on the number and variety and quality of apps in that store; right?

A. In part, yes.

Q. And developers typically favor Apple's platform because iOS apps tend to generate more money; isn't that right?

A. I've heard testimony and seen -- well, I've seen documents that suggest that that's true.

Q. And an example of that happening is that Facebook launched on the iPhone before it launched on Android; right?

A. That would be an example, yes, and that's one factor. I don't think it's the only one but, yes.

Q. And another example is that Tinder launched on the iPhone before Android; right?

A. Yes.

Q. And another example is that Fortnite, which is made by Epic, the plaintiff, launched on iOS before Android?

A. True, yes.

Q. And, in fact, the Google Play Store and the Apple App Store compete for developers; isn't that true?

A. It depends on what you mean by "compete." I addressed that point in my direct testimony. The --

Q. Let me ask you about something that happened in the real world.

So in January of 2018, Google reduced its service fee for subscriptions after the first year from 30 percent to 15 percent. You're aware of that?

A. Yes.

Q. And Google did that to better compete with Apple, didn't it?

A. Google did that to improve their platform. I think that regardless of the competition with Apple, they're benefiting from that. So I don't know that that's the only reason.

Q. Well, were you aware that one of your sources in your own report says that that price reduction was for Google to compete with Apple?

A. I'm sure that that was probably listed as one of the reasons.

Q. And that, in fact, was one of the reasons, wasn't it, Dr. Bernheim?

A. Well, I can only refer to what the documents say.

Q. Okay. Well, let's look at that then.

Would you go to Tab 1 of the binder you have there?

A. I have three binders. Which one would you look like me to look at? Volume 1? Volume 2? Or just D Bernheim?

Q. Bernheim is there, so let's start with Volume 1.

A. Volume 1, okay.

Q. And while we're at it, on your expert reports, you wrote expert reports that identified all of your opinions in this case; right?

A. As far as I know, yes.

Q. And you tried to be as accurate as you could be in those reports because you knew you'd be in court here today testifying about them; right?

A. That's true, yes.

Q. And you used your words very carefully in those reports, didn't you?

A. As carefully as I could.

Q. And you relied on the materials that you cited in those reports, didn't you?

A. I did.

Q. If you could go to page 38 of your report, which is Tab 1, and you'll see there there's a footnote at the bottom, 163, which is your citation for that price reduction I mentioned; right?

A. Yes.

Q. And would you read the title of the article that you relied on?

A. You're referring to "Google Play lowers app subscription fee to 15 percent. Matches Apple's offering"?

Q. Yes. And if you go to the second binder and look at Exhibit 9100, you'll find that article.

A. Second being Volume 2?

Q. Yes, sir.

A. Okay. Because I have three, and the third one isn't labeled with a number, so...

Q. I trust we probably won't be using that third one, and I'll do my best to tell you which volume I'm referring to.

A. All right. So for right now, I'll set that one on the floor. That will make it a little easier.

And I'm sorry. I need you to tell me again which tab to go to.

Q. Sure. No problem. It's Exhibit 9100.

A. I have it, yes.

Wait a sec. Let me turn this.

There. Now we're ready.

Q. All right. Is this the article you cited in your report?

A. I assume it is. It has the same title. I don't remember what they all look like.

Q. Could you read the first paragraph?

THE COURT: Let's not do that. What's the question? We're not going to publish things that are not in evidence. So what's the question?

MR. RAPHAEL: Sure. I'd just like him to agree that his article says that Google reduced --

THE COURT: You can read it silently but not aloud.

MR. RAPHAEL: Very well, Your Honor.

THE COURT: So just read it to yourself.

THE WITNESS: (Witness examines document.) Yes.

BY MR. RAPHAEL:

Q. And the article that you cited in your report says that Google lowered the money it charged app developers to better compete with Apple; right?

A. It does say that.

Q. Now, Dr. Bernheim, you would agree that economic analysis is not abstract math, is it?

A. No, it's not.

Q. And economic analysis, if done properly, should refer to conditions in the real world; right?

A. Yes.

Q. And in the real world, there's a company called Apple; right?

A. Yes, there is. We've talked about it.

Q. And in the real world, there are real people who work at Apple on the Apple App Store; right?

A. Yes.

Q. And your opinion is that the Apple App Store does not compete in the same relevant market as the Google Play Store; correct?

A. Well, that opinion is an opinion that it's a technical opinion that involves the way economists use the word "compete" when we talk about relevant markets. That has to do with evaluating SSNIPs and so forth. It's not necessarily the same statement as when a noneconomist says the word "compete."

Q. Right. And so your opinion that Google and Apple don't compete in the same market with their app stores is a technical opinion, isn't it?

A. It's based on the technical analysis -- it's based on a technical antitrust analysis to determine whether, as a matter of antitrust principles, they belong in the same market for the purpose of evaluating competition.

Q. And it's not necessarily the same way that people who actually are working in the real world would think about competition, is it?

A. Well, it's not necessarily the same way that they would use the word "compete," and that's -- that means that they simply aren't addressing in all situations the same issues that antitrust economists are addressing when we do our evaluations.

Q. So when you reached your conclusion about the relevant market in a technical sense, as you said, you didn't base your

conclusion on any documents created by Apple employees in the real world, did you?

A. Well, I examined a variety of documents. I don't have them all in mind as I sit here right now.

Q. Sitting here today, you actually don't know whether you considered any document created by an Apple employee when you first decided that Apple wasn't in the market; right?

A. Honestly, I would have to page through my reports, which are 600 pages. I don't -- I haven't memorized all of them.

Q. Well, I think we can do that faster because you did a -- you had a list in your opening report of the materials you relied upon, didn't you?

A. I did, yes.

Q. Okay. So if you go to Tab 1 in that first volume.

A. Yes.

Q. You'll go to the back which has pages -- they're in an appendix where the pages actually start with H; and if you go to page H10, I think you'll see a list of documents from companies that you relied on.

A. Okay. I'm at H10.

Q. Do you see there that you have the list of materials from companies that you relied on?

A. I see a list of depositions and then a section that says "Discovery," which appears to include a long list of documents.

Q. Right. And you've testified for a number of times, and

you know those documents have numbers that companies put on them when they produce them; right?

A. Yes.

Q. Can you go through that list and tell me if you see any document that was created by Apple?

A. I think that there aren't documents. There's one that starts with "APL," but I think that that's a Google document. So I don't think that Apple documents are listed here.

Q. Right. So when you first reached the conclusion that Google and Apple do not compete in the same relevant market, you did not rely on any documents created by Apple employees in the real world; correct?

A. None are listed here.

Q. Well, Dr. Tucker did look at -- that's Google's expert? You're familiar with her?

A. Yes.

Q. And she did look at documents from Apple, didn't she?

A. I don't remember specific documents in her report.

Q. Okay. Well, you looked at documents from Amazon, though; right?

A. I did.

Q. And that's another company that in the real world has an app store?

A. I'm sorry?

Q. Amazon has an app store in the real world; right?

A. Yes. I thought you said the opposite.

THE COURT: We're only talking about the real world. So you can stop saying that. All right?

MR. RAPHAEL: Thank you, Your Honor.

BY MR. RAPHAEL:

Q. And there are -- you relied, I think you said, on both documents and testimony from Amazon?

A. I believe so.

Q. Can we look at a document created by Amazon that's already in evidence? This is Exhibit 11405. It should be on the screen in front of you, Dr. Bernheim, if that's easier.

A. I have it both ways.

Q. Then I'll leave it to you.

Do you see here there's a document from Amazon that says that they compared the user experience of the Amazon Appstore versus competitors?

A. I do, yes.

Q. And they identified both the Apple App Store and the Google Play Store as competitors, didn't they?

A. Well, it appears that they mean competitors over a broad range of platforms. In the table, the first column says "Web and Desktop" and the checkmarks are for Amazon Appstore, Google Play, and Apple App Store in that column. So it's not clear what "compete" refers to here.

Q. Your interpretation of this document is that Amazon -- the

Amazon employees who wrote it are not saying that the Google Play Store and the Apple App Store are competitors even though they used the word "competitors"? That's what you're telling the jury?

A. No. I'm saying that they're competitors in the sense that they understand the word "competitors," but that it's not clear from what you're pointing me to in this document whether they mean competitors across platforms or within platforms.

Q. And you didn't rely on this document in reaching your conclusion about the relevant market, did you?

A. No, I didn't.

Q. Now, in analyzing competition in this case, you also looked at documents that were created by Google; right?

A. Yes.

Q. And I think you testified about a Google document or two, and you referred to some of them in your direct testimony?

A. I'm sorry, was that a question?

Q. Yes.

A. Oh. Yes, I did.

Q. Okay. Now, just to be clear, you're not offering expert opinions about the meaning of any individual Google documents; right?

A. I am not.

Q. But let me show you a Google document that's already in evidence. It's Exhibit 5956.

And do you see this is an e-mail from Hiroshi Lockheimer at Google to someone named Jamie, and that's Jamie Rosenberg? Do you see that?

A. I'm sorry. I was flipping to it. Yes, I see that.

Q. Okay. And do you see he's talking about how Apple is offering a 15 percent rev share? Do you see that?

A. In which of these passages? There are three blocks.

Q. It should be on your screen there.

A. Oh, okay. The one on the bottom, yes.

Q. And you see that Mr. Lockheimer is saying that Apple's offering a 15 percent rev share?

A. I do.

Q. And do you see he says "I'm worried that we're about to massively lose this developer base"? And he asks for ideas on what we can do to remain competitive? Do you see that?

A. I see that.

Q. And you didn't rely on this document in reaching your conclusion about the relevant market, did you?

A. I don't remember looking at this document in particular. I looked at many other things.

Q. Right. And in looking at those other many things, you were paid $1600 an hour for your work?

A. Yes, that's correct.

Q. And approximately how many hours did you spend on this matter?

A. Honestly, I didn't add it up so I don't know the answer to that question, but it's many hundreds of hours.

Q. Okay. And is it fair to say you've been paid north of a million dollars for your time in this case?

A. As I said, I haven't added it up. And the way my compensation works with the consulting firm that I work with, I'm not directly paid my billings. So that money in any case doesn't flow to me directly. My compensation is much more complicated.

Q. Right. It's more complicated because you're a partner in the consulting firm and you get a share of their profits; right?

A. Yes.

Q. Now let's talk about Android phones and iPhones for a minute. You testified some about that; right?

A. Yes.

Q. Many millions of people are buying a smartphone for the first time every year; right?

A. I'm sure that's true.

Q. And those first-time buyers, they don't have any switching costs; right?

A. That's correct, although there are some issues if they already own devices.

Q. Right. You testified about the price of Android phones and iPhones comparatively; right?

A. I'm sorry. Say that again.
Q. You testified about the comparative price of Android phones and iPhones?
A. I did, yes.
Q. Could we have Slide 46 from Dr. Bernheim's presentation?
You showed this slide in your direct examination; right?
A. I did.
Q. And this slide shows on average Android phones cost less than iPhones; right?
A. That's one of the things that it shows. It shows more than that.
Q. Right. But the fact that some -- many Android phones cost less than iPhones benefits consumers who can't afford an iPhone; right?
A. Sure. It's appealing to a different --
Q. Can we have slide --
A. -- customer segment.
THE COURT: Hold on. Let's let the witness finish.
Okay. Go ahead.
BY MR. RAPHAEL:
Q. I wanted to talk about that.
Could we have Slide 45 from Dr. Bernheim's presentation?
You showed this slide in your direct exam as well; right?
A. Yes.
Q. And the green bars are Android phones?

A. Correct.

Q. And the blue bars are iPhones?

A. Correct.

Q. And each of these bars is like many millions of phones; right?

A. Sure.

Q. And at every price point where there's a blue bar for iPhones, there's also a green bar for Android phones; right?

A. Yes.

Q. So at every price point where there's an iPhone sold, there's also an Android phone sold; right?

A. Yes, but not the other way around.

Q. And for every iPhone, there's an Android phone that's just as expensive?

A. Pretty much, yes.

Q. And so if you can afford an iPhone, there is always an Android phone for you to choose; right?

A. At those price points, yes, not --

Q. Your chart shows --

A. That's a small fraction of Android phones.

Q. And your chart shows that at those price points where people can afford an iPhone, they really prefer iPhones, don't they?

A. Well, more people are buying the iPhones.

Q. Right.

A. Those who buy the iPhones prefer the iPhones.

Q. It's not easy to compete with the iPhone, is it?

A. I can't imagine that it would be.

Q. And, in fact, in the last several years, the share of people in the United States with iPhones has gone up and the share of people in the United States with Android phones has gone down; right?

A. And the opposite of that in the rest of the world, yes.

Q. Between 2016 and 2021, the share of people in the United States with iPhones went up 10 percent and the share of people with Android phones went down 10 percent; right?

A. My recollection was 6 percent, but I'll take your word for it.

Q. Well, let's just look quickly at Exhibit 6903, which is in evidence.

And you see there in 20 -- between 2016 and 2021, iOS went up 10 percent and Android went down 10 percent in the United States; right?

A. That's what that -- that's what that table is showing.

Q. So the 10 percent shifted from the iOS column to the Android column; right?

A. That's correct.

Q. I think you testified that there's limited substitution between Android phones and iPhones; right?

A. Yes.

Q. I want to just get some principles down if we could.
Two products can be in the same market even if not every one would switch between them; right?
A. They can. The more people who are willing to switch, the more likely they are to be in the same market; and the less -- fewer people, the less likely they are to be in the same market.
Q. You would agree with me that the test for whether two products are in the same market isn't whether any individual person would switch; right?
A. No. That is, no -- no, it isn't. I agree with you.
Q. Thank you.
And you also testified, I think, that people buy phones infrequently. I think that's the word you used.
A. Well, in my testimony I was more precise and said 2.7 years on average.
Q. So on average, that means that someone gets a new phone every two to three years?
A. Yeah. I mean, yes, 2.7. So, yeah.
Q. And so each year roughly one-third to one-half of people with phones shop for a new one?
A. Closer to one-third but, yes.
Q. And there's, like, billions of people with smartphones; right?
A. Sure.

Q. So each year there's hundreds of millions people shopping for a new smartphone; right?
A. I'm sure that's true.
Q. And I think you said that the estimate you had of the switching rate that you found was 12 percent of people switch from an Android phone to an iPhone?
A. When they buy a new phone, I think that that's -- the switching rate in that -- at least that was one of the estimates of the switching rate in that direction.
Q. Right. Do you know who Purnima Kochikar or Hiroshi Lockheimer or Kirsten Rasanen are?
A. Those are Google employees who testified at trial.
Q. Right. You saw their testimony?
A. I didn't read all of their testimony, but I'm familiar with parts of it.
Q. And you're aware, then, that all of them testified that 12 percent of users switching from Android to iOS would be concerning?
A. I don't remember that.
Q. Okay. Well, but you're not telling the jury that you know more than those three Google employees about what would be concerning to Google's business; right?
A. No. I'm sure they're right.
Q. So let's talk really quickly about that price increase test you mentioned. That's the SSNIP test?

A. Yes.
Q. Now, if we could have Slide 48 from your presentation.
And I think this slide kind of summarized the SSNIP test. Do I have that right?
A. In some sense it's summarizing the factors that go into the SSNIP test.
Q. It summarizes the general idea, just not the numbers; right?
A. Yes.
Q. Now, on the left here you see that there's a small increase in price; right?
A. Yes.
Q. But you would agree, and I think we talked about this earlier, that companies compete on quality and not just price; right?
A. Yes. But when we do SSNIP tests to define antitrust markets, we focus on the change in price and the impact of it.
Q. Exactly my point. There's nothing about quality on this slide or in your SSNIP test that you talked to the jury about; right?
A. Quality is held constant when you do the test. It's not that this doesn't take the quality into account. It says, "Okay. The quality is whatever it is for each one of these products. Now we're going to consider the impact of the change in price."

Q. Exactly. And so the SSNIP test isn't measuring what consumers would do if the quality of the Google Play Store went down; right?

A. If you're doing it in price, you shouldn't be doing it in quality at the same time, although in principle you can also do a SSNIP test varying quality instead of price.

Q. Right. You didn't do that, though?

A. I think I wrote something about that in one of the reports. I don't think it really makes a difference because quality can be translated into monetary terms, which means that you can kind of treat it as a price. You reach the same conclusions.

Q. But at a higher level, an economist doesn't even need to use the SSNIP test to define a relevant market; right?

A. Sometimes economists define markets entirely based on more qualitative approaches, evaluating substitution, but the SSNIP -- the SSNIP idea remains the lens that we think about when we consider the magnitude of substitution.

Q. And, in fact, you, yourself, have testified about the relevant market in other cases without doing the SSNIP test that you described to the jury today; right?

A. I think you're referring in particular to the hypothetical monopolist test, which involves a little bit more than a SSNIP. And, yes, I've testified in other cases without doing a hypothetical -- a quantitative hypothetical monopolist test.

Q. Let's talk about the geographic market for a second.

So I think you said in order to define the market, you have to define the geography of the market; right?

A. That's part of it, yes.

Q. And I think kind of like the discussion we were just having about the change in price, when you look at the geographic market, you look at what would -- where consumers would go if the price in one area increased; right?

A. Well, that's based on the consumer substitution principle, right. That's where you start.

Q. Right. So you start by asking if the price of a product in one geography went up, would consumers go to a different geography?

A. Yes, that's where you begin.

Q. Now, your relevant market includes the entire world outside of China; right?

A. Yes, it does.

Q. And so Korea is in your relevant market?

A. South Korea, yes.

Q. Right. And the One Store is an app store in Korea?

A. It is, yes.

Q. And the prices in that store are in Korean won which is the South Korean currency?

A. I assume.

Q. And the names of the apps and the descriptions of the apps

in the One Store are in Korean; right?

A. I assume they are.

Q. And the reviews of the apps in the One Store are in Korean?

A. I haven't tried to read them, but I'm sure they are.

Q. Right. So you don't really think that most Americans are going to switch to the One Store in Korean if the price of the Google Play Store went up, do you?

A. No, I don't.

Q. And, in fact, you haven't analyzed whether users outside of Korea would switch between Google Play and One Store; right?

A. No, I haven't.

Q. Now, you mentioned Iran on your direct examination?

A. I did.

Q. And Iran is part of the relevant geographic market you defined; right?

A. Yes. I also said that -- well, did I say this in my direct testimony or in my report? I don't remember whether I said it in my direct testimony, but to the extent competitive conditions in Iran differ significantly from the rest of the world, that would be an argument for removing them, but that would strengthen my conclusions because the result would be an increase in measured dominance for Google Play.

Q. Right. But when you first set out to define the geographic market, you put in every country besides China,

including Iran; right?

A. I put in all countries for which I had data in large part because Google did not break the data out in a way that would have allowed me to do my calculations in any different way.

Q. So the market you defined in your reports when you first set out to reach your conclusions included Iran; right?

A. It did, yes.

Q. Now --

A. And as a result, it overstates the importance of alternatives to Google Play.

Q. Could we have Demonstrative 5, Mr. Nickels?

So Cafe Bizarre is an app store designed for Iran that's generally in Farsi; right?

A. I haven't actually investigated Cafe Bizarre. I'll take your word for it.

Q. Exactly, right. But the relevant market you defined in your report said that Google Play competes with Cafe Bizarre but not with the Apple App Store; right?

A. If you take it very, very literally, yes. This is an inconsequential aspect of the analysis.

Q. Okay. So in Iran, I think you said that the government there has banned Google Play for a period of time; right?

A. That's my understanding; that from time to time, Google Play becomes unavailable.

Q. And in Iran, as well as 45 other countries, users are not

actually able to purchase paid content through Google Play; right?

A. Yes. In total, those countries don't account for a lot of commerce but, yeah, that's true.

Q. But you still included all of those countries in your relevant geographic market; right?

A. Again, that's the best approximation you can do with the data because we can't eliminate all of them.

I mean, the countries that you have in mind are 1.3 percent of world GDP, so they're just not very significant. It doesn't make a difference. To the extent it does make a difference, again, what it's doing is overstating the importance of alternatives to Google Play like Cafe Bizarre.

Q. You testified about how Google has monopoly power over app distribution. I want to get into that for a bit.

And, again, let's start with some principles. Without market power, a company can't act anticompetitively; right?

A. Yes.

Q. And the presumption among economists is that when firms without market power do something, it's pro competitive; right?

A. Generally, yes.

Q. So with that in mind, let's go back to when the Google Play Store first launched. And it was called Android Market then; right?

A. It was.

Q. And that was around 2008 or 2009?

A. Yes.

Q. And that's right around when Google started offering agreements called the MADAs?

A. It is.

Q. And that's right around when the consent screens for sideloading started appearing?

A. As I recall, yes.

Q. And when Google Play launched in that time period, it was a small entrant in the market, wasn't it?

A. That's -- Google Play, obviously when -- at the very beginning it was a small player. It grew rather rapidly because it and Apple had both come out with revolutionary products, and they kind of had first-mover advantages in this scenario.

Q. Right. So in the time period that I'm talking about when Google Play launched, Google had come out with a revolutionary product, and it was a small entrant; right?

A. It was a small but rapidly growing entrant. By the time you got a couple years later, it was quite a substantial operation.

Q. Right. But when Google Play first launched, it followed a small entrant strategy by matching Apple's service fee; right?

A. That appears to be what it did at that time.

Q. And Apple's service fee was 30 percent then, and Google

also set its fee at 30 percent; right?

A. Yes. At that time, yeah.

Q. And when Google followed that small entrant strategy of matching its price to Apple, you're not arguing, then, that the market was limited to Android; right?

A. Wait. You just changed what you were asking me about. Before you were talking about commission rates and now you're saying price.

Q. Oh, I'm happy --

A. Commission rates are not prices.

Q. I think -- we'll get to that, but let me ask a clearer question then.

When Google followed a small entrant strategy of matching Apple's service fee, you're not arguing that the market was limited to Android; right?

A. As we understand the term "service fee" to mean commission rate, you're asking me at that time was the market limited to Android? Was that the question?

Q. Yes.

A. I haven't done the analysis to make that evaluation.

Q. And if a company didn't start off with market power but got it sometime later, what you'd expect is that they would be raising prices or holding prices consistent while reducing quality; right?

A. Well, under certain conditions, yes. You're describing

unusual conditions here in that you have a new emerging market with a revolutionary product which leads to a different dynamic. But under other conditions, I certainly agree that that's true.

Q. And since the time that Google first started charging that 30 percent fee as a small entrant, Google's net commission rate hasn't gone up, has it?

A. I think it has. I mean, at the very beginning when it was charging 30 percent, it had deals with many of the carriers where it gave away 25 percent of that. Google's net was 5 percent at that point after it paid the OEMs -- not the OEMs --

Q. Sir --

A. Did I say OEMs? Carriers.

Q. -- I'd just appreciate if you could answer my question.

The developers -- the commission rate that the consumers of the Play Store the developers and the users paid, that has not increased since 2009; correct?

A. The percentage that developers paid hasn't changed.

Q. Right.

A. What Google has received has changed.

Q. And you haven't reached any conclusion about what happened with the overall quality of the Play Store since that early 2009 time period; right?

A. I'm sure there's been improvements.

Q. Now, while we're on the topic of monopoly power, let's talk about market share. You testified a bunch about that; right?

A. Yes, I did.

Q. Now, just to be clear, market share is not the same thing as monopoly power; right?

A. Definitely not.

Q. And your basic point about market share is that Google Play has a lot more downloads than other Android app stores; right?

A. Not just a lot more but a high proportion, which is what economists find as an indicator, a strong indicator, of market power.

Q. But evidence that Google has a significant market share, that doesn't tell you whether or not that market share was gained through anticompetitive or competitive means; right?

A. Not by itself, no.

Q. The fact that the share is high doesn't tell you how Google got the share; right?

A. That's correct. In fact, in this case I don't think that there's any challenge to conduct regarding Google's share of operating -- of the operating system market.

Q. Now, a company might gain share simply by competing more aggressively; right?

A. Yes, it can.

Q. And a company might gain market share by offering a better product; right?

A. Yes, it can.

Q. And another way a company might have a bigger market share is just by having more stuff in stock; right?

A. Having more stuff in stock?

Q. Yes.

A. Well, I suppose there are circumstances in which that will improve market share.

Q. Like in general, the more products that you stock, the more products you're going to sell; right?

A. Mechanically. I mean, just stocking more products may mean your profits go down and then your share shrinks. So I think it's -- the dynamics are not quite that simple.

But if you're just asking me mechanically selling more things without changing your prices of the other things that you sell, sure, you will sell more.

Q. Like Costco sells more than a convenience store; right?

A. It doesn't sound like the same question that you just asked; but, yes, Costco sells more than a convenience store.

Q. And that's one reason that people like to shop at Costco; right?

A. You mean that it has more products than a convenience store?

Q. Yes.

A. Yes, some people prefer Costco for that reason. Some people prefer the convenience store for other reasons.

Q. And Google Play offers more apps than competing app stores on Google Play; right?

A. Yes, it does.

Q. As of 2022, there were 3.3 million apps on the Google Play Store?

A. The right ballpark. I've seen it as ranges.

Q. But as of that time, there were only 220,000 in the Samsung Galaxy Store; right?

A. As I discussed.

Q. That's only about 6 percent as many?

A. It sounds right.

Q. And Amazon had only 400-some-odd thousand; is that right?

A. Amazon had I think 480,000.

Q. And that's only about 15 percent of the apps that Google Play had?

A. Yes.

Q. So let's talk not about the number of apps but the most popular apps. And I think you testified a little bit about that as well?

A. Yes.

Q. And it's true that other Android apps -- excuse me -- other Android app stores generally lack most of the most popular apps that Google Play has; right?

A. Well, I talked about Samsung and the Amazon store in my direct testimony. For the Amazon store, it was half. So I'm just trying to be precise. That's not actually most. It's just exactly half.

Q. Yeah, I wanted to ask you about the difference between Samsung and Amazon, so we'll get there in just a moment.

You showed a chart about the most popular apps worldwide, I think; right?

A. Is that the one that we put up? I think that's right.

Q. So you also had a chart in your report, though, about the most popular apps in the United States?

A. Yes.

Q. So could we have Demonstrative 6, please?

And I've recreated a bunch of your chart with your demonstrative so it's a little easier to see. You can follow along on page 30 of your report if you want to check whether I've got it right.

A. This is opening report?

Q. Yes.

A. All right. I'm there.

Q. Okay. So I'm just going to do the ones on the screen, but I just wanted to let you know where it came from.

A. Uh-huh.

Q. So I think you talked about how there was some disparity that was significant between the Samsung store and the Amazon

store in terms of how many of the most popular apps they had?
A. I indicated that they had more of the most popular apps.
Q. So if you look at the chart of the United States, though, Samsung and Amazon, they don't have WhatsApp; right?
A. Yes.
Q. They don't have Disney Plus; right?
A. Yes.
Q. They don't have Netflix?
A. Yes.
Q. They don't have Snapchat?
A. Yes.
Q. They don't have Roblox?
A. I can stipulate that they don't have any of the ones that have red Xs in them.
Q. Right. They don't have DoorDash or PayPal or Spotify; right?
A. Well, yes, that's what this says.
Q. In fact, according to your report, the Amazon Appstore doesn't even have the Amazon shopping app, does it?
A. I'm sorry?
Q. The Amazon Appstore doesn't even have the Amazon shopping app according to your report; right?
A. I don't remember that.
Q. But the Google Play Store has all of these apps, doesn't it?

If we could have the next slide.

A. Yeah, it does.

Q. And Google doesn't have exclusive deals with all of these apps; right?

A. Yeah. I'm puzzled, though, why you've listed the apps that you've listed. You say you took this from my table, and there are 20 apps that are listed in my table.

Q. Right, sir. I just took some of them. Your counsel can ask you about the other ones if he'd like.

My question is --

A. I'm just asking whether there was a reason that we're looking at these.

Q. My question, sir, is that Google does not have exclusive deals with these apps; right?

A. That's correct, as far as I know.

Q. Right. And so if these really popular apps wanted to be in the Samsung store or the app store, they could -- or the Amazon Appstore, they could choose to do that; right?

A. They could choose to do that.

Q. So we've been talking about market share, and I want to switch now to talk about prices.

And I think you mentioned this earlier, but on direct examination you testified that Google's prices for app distribution have been going up; right?

A. If we think about the economic price of app distribution,

that's correct.

Q. Now, even if that were true, it would be dangerous to accept evidence that a firm increased prices as an indication that it has market power; right?

A. By itself, yes.

Q. Because that would open the door to finding that all kinds of firms have market power even when they don't; right?

A. It could, which is why we look at many things when we evaluate market power.

Q. Right. In fact, Epic itself recently raised prices, didn't they?

A. I don't know that I'm aware of that.

Q. But you're not opining that Epic has market power; right?

A. Well, price increases occur for lots of reasons. For example, because costs go up. That doesn't reflect market power. You have to investigate the circumstances and look at other indicators as I did.

Q. So I want to look at the charts that you showed.

If we could have Slide 58 from Dr. Bernheim's presentation.

You showed this slide during direct examination?

A. Yes, I did.

Q. Right. Now, this is a chart of app revenue per download; right?

A. This is, yes, the revenue generated from the app per app.

That is Google Play revenue generated from each app that is downloaded.

Q. Right. And so the prices on this chart, like this isn't the actual price that Google charges anyone for a download; right?

A. Well, from an economist's point of view, you have to ask when you're talking about price: What is the value that Google Play is receiving in return for what it's providing?

Google Play, to these buyers, the developer in particular, is -- well, it's providing app distribution services. The developer in return for that is providing an agreement that allows Google essentially to tax transactions.

The value of that consideration that Google is receiving in return is the price. From an economist's point of view, that is the price. It's the value of consideration.

Q. I'm just asking you, Dr. Bernheim, if the developers actually pay the money that's on your bars here.

A. Well --

Q. No one pays 35 cents every time an app is downloaded; right?

A. No. That takes the form of the fees that follow from the download.

Q. Right.

A. That's the compensation that Google Play is receiving.

Q. And, in fact, companies like Epic get millions and

millions of downloads without paying service fees; right?

A. Well, if you're talking about the fee that they pay for the download itself, that's right.

Q. All right. And Google doesn't charge a fee for each download because that might discourage people from trying out new apps; right?

A. I understand that that's part of the reason for doing that, yeah.

Q. Now, in your chart, Google is earning more app revenue for each download over time; right?

A. Correct.

Q. And app revenue is a reasonable way to measure the value that consumers get from apps that they download; right?

A. Yes, apps that the developers are creating.

Q. Right. And so what your chart shows is that consumers are getting more and more value from the apps that they download over time; right?

A. Yes. Developers are creating more valuable -- value for consumers, and Google is taking a slice of that. The fact that it's in a position to do that is indicative of market power.

Q. And delivering more value to consumers is what companies do to compete; right?

A. That's part of what they do to compete; but when they're competing, they don't take a slice of --

Q. Now, by the way, on this chart that you showed, the

revenue is from in-app purchases; right?

A. This is from app transactions. So that would be in-app purchases and I believe subscriptions.

Q. And your view is that the money that Google earns from in-app purchases is relevant to the market for app distribution; right?

A. I'm sorry, did you say relevant or irrelevant?

Q. Relevant. The money that Google earns from in-app purchases is relevant to analyzing power in the market for app distribution; right?

A. Yes, because this is the nature of how Google charges for app distribution. It receives a commitment from the developer that has value and this is the value.

Q. Right. And that's because Google's service fees that it charges are the combined price for app distribution and the payment services; right?

A. They also cover payment services, yes.

Q. So it's the combined price of app distribution and payment services; right?

A. I agree that this would also include payment services, but that number hasn't changed appreciably over time. There's no reason to think that it has.

Q. Well, sir, I'm just asking a very specific question, which is that the service fee that Google charges is for app distribution and payment services; right?

A. Yes, it is.
Q. I think you said something about comparing Google's commission rates to other app stores?
A. In my testimony?
Q. Yes.
A. I know I said that in my report.
But go ahead. I mean, I have made those comparisons, so ask away.
Q. Just because a company charges more than another company doesn't mean that it has market power; right?
A. That's true.
Q. A company could charge a higher price because it has a higher quality product?
A. Yes.
Q. And you haven't done any work to determine the quality of other app stores compared to the quality of Google Play; right?
A. No, I didn't try to assess market power that way.
Q. And it's inappropriate to compare prices without also comparing costs; right?
A. It depends on what -- it depends on what your purpose is; but if we're assessing market power, that's certainly something you would want to consider.
Q. And Epic's costs for the Epic Game Store have been much higher than its revenues; right?
A. I'm sorry. Ask that again.

Q. Epic's costs for the Epic Game Store have been much higher than its revenues; right?
A. From the Epic Game Store. So we're talking about PCs now?
Q. Yes.
A. Okay. I don't remember those numbers.
Q. So you're not aware that Mr. Steve Allison was Epic's first witness in this case?
A. I am. I'm saying that I don't remember those numbers.
Q. So you don't remember whether he testified -- forget the numbers -- that Epic has been losing a significant amount of money on the Epic Game Store?
A. I think that that's right, yeah.
Q. And that's something you would want to factor into comparing the service fee from the Epic Game Store to other stores; right?
A. You'd want to take that into account.
Q. So we've been talking about prices. Let's talk now about profits. And that was another thing you testified about; right?
A. Yes.
Q. A company can earn profits even though it faces competition; right?
A. Not durably. I mean, if it -- it depends upon the intensity -- I'm sorry. Let me be clear.
It's hard to answer that question without saying something

about the intensity of competition. So, you know, some level of competition is consistent with earning profits.
Q. A company could earn a substantial profit by making significant investments; right?
A. I think that question reflects confusion on the concepts. When we talk about profits -- when I talk about profits, I'm talking about economic profits. So I'm taking into account the investment and thinking about the return on the investments and whether that's above cost of capital. So investment isn't separate from this. It's part of the profit calculation.
Q. Dr. Bernheim, a way to earn a lot of profits is to invest a lot; right?
A. It usually reduces your profit rate rather than increasing it.
Q. Well --
A. You mean it increases the scale of your operation? I'm not sure what you're asking, honestly.
Q. I'm just asking that you can become a very profitable company over time by investing a lot of money early on; right?
A. Sure.
Q. And according to your estimate, Google spent $54 billion to create and maintain Google Android, including the Play Store; right?
A. Yes, and made that back many times over.
Q. Right. And you showed Slide 59.

If we could have that on the screen.

You showed this on direct examination?

A. I did.

Q. But you didn't put Google's net commission rate on this slide; right?

A. No.

Q. So if we could have Demonstrative 8, I'd like to do that.

And I've taken this from Figure 66 of your report.

So Google's net commission rate isn't going up, is it?

A. No. Google's -- I'm sorry.

Q. The reason why Google -- the reason why Google is earning a higher profit margin over time is not because it's raising its commission rate; right?

A. Well, it depends on whether you factor in the deals with OEMs back in the 2011-2012 time frame. Whereas, I said before, you know, the right way to think about net commission is you've got to net that against the commission, in which case they started down at 5 percent. This figure, the line that you put in there, the green line, doesn't reflect that. So that's one issue.

The other issue is the one that we discussed a little while ago. Look, by keeping the percentage the same, if the value creation of the developers is going up, you're making a lot more money and what you're earning is increasingly deviating from your costs because, you know, that's something

that somebody else is created.
Q. Right. I think you anticipated my question.
So the blue bars that we see here, that's the revenue that Google's getting from service fees; right?
A. The blue bars are app-related fees, yes.
Q. And that's a percentage of what the developers are earning; right?
A. Generally, yes.
Q. And the increase in those blue bars is contributing to why the red line of the profit margin is going up; right?
A. Of course.
Q. And so one reason why Google's profit margin is going up is that developers are earning more money; right?
A. Yes. And Google is taking a share of that, and that's not being competed away. In a competitive market, that would be competed away.
Q. Well, let's talk about the consent screens, if we could; right? I think you call these maybe the sideloading warnings?
A. Yes.
Q. You're not an expert in mobile device security; right?
A. I am not. I defer to the experts who have already testified on that issue.
Q. So could we look at Slide 22 that you showed the jury? This was the chart based on Epic data; right?
A. That's correct.

Q. And this slide shows how many people made it through each step of the process of sideloading Fortnite?

A. It does.

Q. And you found a 35 percent dropoff between 2A and 3; right?

A. That's correct.

Q. And that's where people see the consent screens?

A. For the Epic Games app.

Q. But you don't know why that 35 percent of people actually dropped off; right?

A. No. We can only observe when they dropped off, that's right.

Q. Right. And so after that time period you've highlighted in red, there's another steep drop; right?

A. Yes.

Q. That's between Steps 3 and 4?

A. Yes.

Q. And Step 4 says "Passed or failed min spec"; right?

A. Right.

Q. And the min speck issue is whether the user's device can actually run Fortnite?

A. Yes. So the first part of this is for EGA. And at this point we go to Fortnite and to install Fortnite, you have to have minimum specifications for the phone.

Q. Right. So I just want to unpack that a little bit to make

sure we understand.

So the EGA you referred to is like a launcher that Epic has where you can launch the games from?

A. Correct.

Q. And that's what's at issue with the 35 percent you have there?

A. That's my understanding, yes.

Q. But once you get past Step 3, what we're talking about is whether you can actually, like, launch the game?

A. Well, whether you can launch Fortnite.

Q. Right. That's what we're talking about after Step 3?

A. That's my understanding, yes.

Q. And it's just true that the Fortnite game actually doesn't work on the phones that many people have; right?

A. That's correct.

Q. And Google doesn't have anything to do with that min spec problem; right?

A. No, it doesn't. That's a matter of Epic designing for certain phones and at some point in the process, people who don't have those phones need to be screened out. It happens that that occurs between Steps 3 and 4.

Q. Right. And so your chart shows that a significant percentage of people were unable to launch Fortnite because of something that Epic did, not something Google did; right?

A. That's correct.

Q. And so even if the consent screens or sideloading warnings were different, some of those 35 percent of people actually wouldn't be able to use Fortnite; right?

A. Well, I think the way to say it is some fraction of the people at the start are not Epic's target customers and they haven't been removed yet. We don't know who they are until you get to Step 3. So the 35 percent just shows that customers generally, 35 percent of them, drop off when they see the warnings.

Q. Now, you relied on the testimony of Dr. Mickens? I think you said that earlier.

A. I did.

Q. And he's Epic's computer security expert who testified the other day?

A. He is. I'm not sure I said that earlier but, yes. Go ahead.

Q. And he proposed some ideas for other ways that the sideloading flow could look; right?

A. He did.

Q. And you haven't calculated how many people would actually sideload Fortnite if that's what the flow looked like; right?

A. Well, I think what Professor Mickens --

Q. Have you calculated it or not, Dr. Bernheim?

A. No. I wouldn't need to.

Q. Now let's shift from sideloading to RSA 3.0. You

testified about that?
A. I did.
Q. Could we have Slide 206 from Dr. Bernheim's presentation?
Now, I think you referred to this on direct. I just want it to be really clear. The chart here has a 41 percent figure; right?
A. Yes.
Q. And that's 41 percent of phones activated in this month in 2022 were at the premier tier; right?
A. 41 percent of phones for this group of OEMs, which excludes Samsung.
Q. Right. Just so we're super clear, your 41 percent figure excludes Samsung; right?
A. That's correct.
Q. And so even at this time period, though, the percentage of -- 60 percent of phones that were sold in August of 2022, had no restrictions of having an app store besides Google Play; right?
A. That's correct.
Q. And you said you excluded Samsung. Samsung is the largest of all the manufacturers of Android smartphones; right?
A. Yes, which is why I addressed Samsung separately.
Q. And if this chart did include Samsung, the percentage of devices covered would be lower; right?
A. Sure.

Q. And you never reported the figure in your analysis of what the figure would be if Samsung was included; right?

A. Well, actually, let me -- what I said was not right. Let me correct it.

The 41 percent figure would be smaller, but none of the other bars in the figure would change. So all of the conclusions that I drew from that would be completely unaffected.

Q. The 41 percent figure would be lower if Samsung was included; right?

A. That one number would be lower. None of the other features of the figure would change.

Q. And you haven't reported what the overall number would be with Samsung included; right?

A. No, but it's a relatively easy calculation given --

Q. Right. It's not a calculation you did, though; right?

A. I mention it in my reply report I'm pretty sure because Dr. Gentzkow talked about this.

Q. Right. Google's expert Dr. Gentzkow included Samsung; right?

A. He did, yes.

Q. Okay. Let's talk about Project Hug.

Now, none of the Project Hug agreements forbids anyone from opening their own app store; right?

A. I'm not sure that that has not been challenged. Well, the

formal agreements, yeah. I think that that's right about the formal agreements.

Q. Right. And you're familiar with the phrase "but-for world"; right?

A. I am, yes.

Q. That's a world where the challenged conduct didn't happen?

A. Correct.

Q. So the but-for world is one where the Project Hug agreements didn't exist; right?

A. You could certainly use the term that way.

Q. And you haven't tried to reconstruct the but-for world without the Project Hug agreements for any of the app developers; right?

A. No. What I'm doing is -- no, that's right. That's --

Q. And what that means is you haven't tried to figure out what any of the Hug developers actually would have done without those agreements; right?

A. Right. I can just speak to their economic incentives.

Q. Right. And you're not aware of any evidence regarding whether it was the Project Hug agreements that caused anyone to choose -- that caused Activision to choose not to launch its own app store; right?

A. Well, I mean, there is some documentary evidence that speaks to that at some level. I remember that Activision was negotiating with Samsung and then signed a Hug agreement, and

those negotiations ended.

MR. RAPHAEL: Could I have page 97, lines 11 through 20 of the deposition, Your Honor? It's in Tab 3 in Volume 2.

(Pause in proceedings.)

THE COURT: Okay.

MR. RAPHAEL: Can we have that?

BY MR. RAPHAEL:

Q. So you were asked (as read):

"Are you aware of any evidence that indicates one way or another whether it was the Project Hug agreements that caused Activision to choose not to launch its own app store?"

And you said (as read):

"No, I'm not."

Correct?

A. At that time -- I know that I said this in my report, and I guess I didn't remember it during the deposition.

Q. And your opinion -- we can take that down -- your opinion is that potential Android app store makers face entry barriers arising from the nature of the market; right?

A. Well, there's a combination of the difficulties that I described with Google Play as the incumbent, which by itself is not anticompetitive, that gets combined with the artificial barriers that I described.

Q. Well, entry barriers means that it's hard to open an app

store; right?

A. It does.

Q. And it's expensive to open an app store?

A. It's hard to succeed. It's not necessarily expensive, but there are certainly expenses and that can be part of the reason why, you know, parties don't open the app stores.

Q. And Google launched Project Hug as a way to incentivize large gaming developers to favor Google Play in response to the threat of losing their business; right?

A. In the large sense, yes. The threat of losing their business included losing their business because competition was potentially emerging at that point in time.

Q. The incentives that Google offered through Project Hug had the effect of lowering the commission rate that app developers paid; right?

A. It did, yes.

Q. And through Project Hug, Google provides discounts to developers on Google products and services; right?

A. It does.

Q. And discounts are a form of competition; right?

A. They are usually a form of competition. They can become problematic when combined with other conduct like parity clauses.

Q. I want to close by talking about the Samsung Galaxy Store which you talked about, and I want to show you a chart from one

of your reports.

So if we could have Slide 9, please.

So this is a chart from your report and it has a bunch of conduct on the top and potential rivals on the left side; right?

A. It does.

Q. Could we blow up the Samsung row, please?

So let's go row by row here. Your chart has a checkmark for each type of conduct that you say affected the rival; right?

A. I think you meant column by column but, yes.

Q. Yes, column by column.

So let's look first at Project Hug; right? We were talking about that a minute ago.

The Project Hug agreements don't prohibit developers from using both the Samsung store and the Google Play Store; right?

A. No, they don't. What they do is prohibit --

Q. In fact, some of the Hug developers that have become -- that have those agreements --

THE COURT: Let's let the witness finish. Okay?

MR. RAPHAEL: I apologize, Your Honor.

THE COURT: Please, finish your answer.

THE WITNESS: Yeah. They prevent differentiation through exclusive content.

\\\

BY MR. RAPHAEL:

Q. Well, it's just true, right, that some developers that have Project Hug agreements have games in the Samsung Galaxy Store too? Right?

A. As far as I know.

Q. And then you have a column for RSA 3.0 premier; right?

A. I'm sorry, yes.

Q. And there's no checkmark in that box for the Samsung Galaxy Store; right?

A. That's right.

Q. Because we already established that Google's conduct with respect to the RSA 3.0 didn't affect Samsung; right?

A. That's correct.

Q. And Samsung's agreements don't require exclusivity for Google Play; right?

A. That's correct.

Q. Now, the next column you have are "Preload Placement Restrictions"; right?

A. Yes.

Q. And there's no checkmark in that box; right?

A. That's correct.

Q. Because the Samsung Galaxy Store is preloaded on nearly all Samsung smartphones; right?

A. That's right.

Q. And there are more than 1 billion Samsung devices in the

world; right?

A. Is it 1 billion? That sounds about right, yeah.

Q. So there are more than 1 billion devices in the world with the Samsung Galaxy Store preloaded; right?

A. I think that's right.

Q. Now, in the next column you have "Direct Downloads"; right?

A. Wait. Well, I think that there's a qualification to the last question, but I'm not sure it's terribly important, so let's move forward.

Direct download degradation, yes.

Q. And there's no check box in that box because they don't see sideload warnings when they download apps from the Samsung Galaxy Store; right?

A. That's correct.

Q. And in the next column you have "Rival Buyoffs"; right?

A. Yes.

Q. For Samsung, the checkmark in that box is, like, faded out; right?

A. It indicates, as we said before, the Project Banyan didn't reach fruition.

Q. Right. You couldn't bring yourself to actually check that box because a deal between Google and Samsung was never reached; right?

A. I don't think that that's a fair way to describe what goes

on in that box. I'm correctly indicating that Google deployed a strategy that had deployed in many other instances, that it didn't work out for them. And then I think the -- you know, the testimony that I gave earlier was talking about how that was followed by renegotiations that led to a revenue sharing agreement.

Q. Right. But there's no full checkmark there; right? It's just a faded-out one; right?

A. Because it's referring to Project Banyan, that's right.

Q. Right. And your footnote there, Footnote 1, says "A deal with Samsung from Project Banyan was never reached"; right?

A. That's correct.

Q. Okay. So let's wrap up by talking about Epic and the Samsung Galaxy Store.

And as we sit here today, when it comes to Android app stores, Epic exclusively distributes through the Samsung Galaxy Store; right?

A. It does.

Q. And that's the type of exclusive distribution arrangement that you say can help a competing app store get traction; right?

A. It can when the competing app store is intent on competing.

Q. And Fortnite is one of the most popular games in the world; right?

A. It is, yes.

Q. And Epic's game doesn't actually work on all Android phones. We talked about that; right?

A. Right.

Q. But for the users who have phones that actually run Fortnite, they can buy V-Bucks inside the Fortnite app that they get from the Samsung Galaxy Store; right?

A. Yes, they can.

Q. And no matter how many of those 1 billion users who can get the Fortnite app from the Samsung Galaxy Store, download it, and buy V-Bucks, Epic doesn't pay Google a single penny; correct?

A. As far as I know, yeah.

MR. RAPHAEL: No further questions, Your Honor.

THE COURT: Okay. How much do you have?

MR. BORNSTEIN: I'll be very brief, Your Honor. Five minutes maybe.

THE COURT: Just we'll finish with this witness and be done for the day.

Please go ahead.

MR. BORNSTEIN: All right. Thank you for the accommodation, Your Honor.

REDIRECT EXAMINATION

BY MR. BORNSTEIN:

Q. Professor Bernheim, there were a couple questions you just

received about Project Hug, which we've all talked about lot. Do you remember talking about Project Hug?

A. I do recall.

Q. Okay. And you were asked whether or not those agreements were intended to provide or had the effect of providing discounts to the developers who signed the agreements. Do you recall that?

A. I do.

Q. Were those discounts unconditional?

A. No. They were conditional on agreeing to the parity requirements that preclude rival app stores from differentiating themselves. So this is paying developers to impose a condition that restricts competition.

Q. And so from the perspective of an antitrust economist, how were the Hug agreements different from just straight-up ordinary discounts in terms of their effect on competition?

A. Straight-up ordinary discounts would not be conditional in that way, and then they would simply be price reductions.

Here, the reduction in commission fees, Google is getting something in exchange for that, and what it's getting in exchange is something that allows it to block successful entry.

Q. One other question on Project Hug.

Just near the end of the exam, you were shown a demonstrative relating to Samsung where you pointed out that those were columns rather than rows. Do you recall that?

A. I do.

Q. And there were a number of Xs that were populated along the way as counsel went through the questions.

Did you agree with the decisions to put Xs in all of those boxes that counsel made?

A. I'm not sure what you mean.

Q. Sure. I'll start with there was a very first box relating to Project Hug where you had a checkmark on your report, but counsel put an X in there. Did you think that was fair?

A. Oh. No, I didn't remember that he put an X on that one. No, that misses the point.

Q. How so?

A. Samsung -- remember, Samsung only accounts for about 1 percent of app downloads for all of the preinstallations that they have. They're making very few sales. In order to get traction as a small player in this market, they would have to be able to differentiate themselves. Hug prevents them from doing it.

Q. You were shown a chart from your report in your direct testimony of profits, and counsel overlaid on it the net commission rate. Do you recall that?

A. I do.

Q. And a couple of times you gave some testimony, or tried to give some testimony, about how the increase in profits while commission rate was declining a little bit, but not too much,

was indicative of monopoly power on Google's part. Do you recall that?

A. Yes, I do.

Q. Can you please give the explanation as to why that chart that counsel showed actually demonstrates monopoly power on Google's part?

A. Sure. If you're maintaining a commission rate that's delivering more and more revenue that is coming from the activity of others, from the developers, in a competitive environment, that would get competed away. Those -- those commission rates would get competed down until the returns the app distribution provider was receiving were closer to their costs, were tethered to their costs.

What you're seeing in that figure is that their revenues are just tethered to, you know, what the developers are doing, not to their own costs, and that's kind of -- that's kind of the essence of market power.

Q. So there was a moment when you were looking at page 30 of your report, which was the page that related to apps that were on the Samsung store versus on the Amazon store, and you made a remark about the selection of apps that appeared on counsel's demonstrative versus the apps that are actually in your report, and counsel invited me to ask you about it, so I'm asking you about it.

What was it that you wanted to say about counsel's

selection of apps?

A. No, I didn't -- I was just confused as to why counsel had selected the apps and whether that was part of the question, why he was trying to focus my attention on apps.

The ones he picked I think had a significantly higher frequency of nos. There are more yeses in the table, and those seem to have disproportionately dropped.

Q. I see. Two other quick things, Professor.

One is, you were shown some charts about switching from iPhones to Android or Android to iPhone near the beginning of the cross. Do you recall that?

A. Some. You said some charts?

Q. Some tables with numbers showing switching of percentages from iPhone to Android or Android to iPhone use. It's Exhibit 6903, if that's helpful.

A. Let's look at it because I'm remembering something that's not quite that. Oh, I had it open to the right page.

Yeah, this isn't actually switching. This is operating system shares.

Q. I apologize. You are, of course, right.

So you were asked, however, about the movement in shares from iOS to Android; correct?

A. I was, yes.

Q. All right. Does that movement in share from one operating system to the other tell you anything one way or the other

about competition between app distribution on iOS versus Android?

A. No. This is a really long distance from app distribution.

Q. What do you mean?

A. Well, this is just shifting of the total number of -- total number of units which could be changing for a lot of reasons that, you know, are unrelated to anything.

I mean, something like, you know, economic activity changes differently in different countries and the countries have -- well, I'm trying to give an example and not coming up with the right one.

THE COURT: That's okay. You've got one more. You said two. You've already had four. All right. One more.

MR. BORNSTEIN: Okay. I think I came from one more, Your Honor, which is let's take a look at Exhibit 11405.

TECH PERSONNEL: Ms. Clark, can you move to our side, please?

THE WITNESS: (Witness examines document.) Yes.

BY MR. BORNSTEIN:

Q. All right. And you were asked some questions about this slide. I want to call your attention -- this document.

I want to call your attention to the top right corner where it says "Amazon Benchmarking."

A. Yes.

Q. And you had talked a little bit about benchmarking in your

direct exam. What does benchmarking mean in this context?

A. Well, benchmarking appears to -- they've got all these platforms listed on this document, and I think what they're doing is just looking at stores that do similar things in order to evaluate, you know, what they do well and what they do poorly to try and improve their own offering, which is what, you know, competitors are supposed to do.

Q. Does that show competition in the antitrust economist sense of the term?

A. No, it doesn't. As I said before, benchmarking can just be we're looking at these because, you know, they do something that's similar and maybe in similar context, maybe on a different platform.

MR. BORNSTEIN: Thank you very much, Your Honor.

Thank you, Professor.

THE COURT: Okay. You may step down. Thank you.

(Witness excused.)

THE COURT: All right. End of the day. Making excellent progress. See you tomorrow morning. Remember, put this all out of mind. No research. No talking. No thinking. We'll see you at 9:00 a.m.

THE CLERK: All rise.

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. What's happening tomorrow?

MR. BORNSTEIN: So tomorrow, Your Honor, we have our

other economist who talks about the payment market, Professor Tadelis, and then we'll be turning over the baton to Google to have their economists come.

THE COURT: All right.

MR. POMERANTZ: And that's right, Your Honor. I think that will take up all of tomorrow. I think we all feel pretty confident that with three economists testifying, we hope we can get it all done tomorrow, but that's a pretty heavy lift, but we'll try.

THE COURT: Well, let's finish it tomorrow. Okay? We really have to get this wrapped up.

MR. POMERANTZ: Your Honor, the one thing I would say is we have used far fewer hours than they have so far. Our experts when they testify -- we want to make sure, just like they spent probably two hours with Dr. Bernheim in his direct, we would just appreciate the same accommodation.

THE COURT: Of course. Look, no one is going to lose out on fairness that way; but, you know, there is some value to just letting the experts have a conversation and not burning an hour on cross-examination. I mean, just let the experts handle it. So you may want to think about that. Okay?

I mean, that's what they're here for; and, you know, think of it as a mini hot tub in some respects. I don't know if the cross-examinations are as useful as having the experts engage in direct dialogue, you know, serially, so...

MR. BORNSTEIN: I'm going to press my luck here, Your Honor, and say that makes the rebuttal really important.

THE COURT: Well, not if there's two hours of meandering cross-examination in between, and that will affect my appetite for rebuttal.

MR. BORNSTEIN: I hear you loud and clear.

THE COURT: All right.

Okay. And that goes for you too.

We'll see you tomorrow.

MR. BORNSTEIN: Thank you, Your Honor.

(Proceedings adjourned at 3:45 p.m.)

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CERTIFICATE OF REPORTER

I certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

DATE: Monday, November 27, 2023

Kelly Shainline

Kelly Shainline, CSR No. 13476, RPR, CRR
U.S. Court Reporter